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ABSTRACT

This document collects five presentations in the field of vocational counseling and guidance. Its aim is to share research reports with vocational counselors, enhancing the level of this service in Canada. In the first paper, Benjamin Gottlieb discusses social networks and the gestalt of help-seeking, pointing out that persons are attached to social networks, and that when these networks are torn (by divorce, loss of job, death), the individual needs help to form new attachments. The second and third papers in the collection concern peer counseling and peer intervention. In the second paper, Rey Carr details the rationale, origins, and practice of peer counseling, with particular applications to involving adolescents as peer counselors. The author takes the view that teenagers have been ignored as a source of positive help to other teenagers and that they can be trained to help others make effective decisions. In the third paper, P.S. Sussman surveys reports on research with peer counselors, concluding that more careful study should be made of peer intervention systems before encouraging their widespread use. The feasibility of using computers to assess vocational aptitudes is explored by Robert Knights and Clare Stoddart in the fourth paper. The authors conclude that it would be possible to automate parts 1 to 7 of the General Aptitude Test Battery, although the development of a completely new battery of tests to take advantage of the computer is recommended. In the final paper, Andre Lepine evaluates the Certification in Testing program for employment counselors, focusing on persons who have participated in the program, and makes recommendations for further study. (KC)

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Preface

Vocational counselling and guidance is important in helping Canadians plan for, enter and succeed in the labour market. For this reason the Canada Employment and Immigration Commission (CEIC) undertakes research and development to improve the methodology of vocational guidance and employment counselling. Many of the counselling tools that are created for CEIC are freely shared with schools, rehabilitation agencies and other organizations. The NATCON series provide a means of sharing research reports with vocational counsellors thus further enhancing the level of service throughout Canada.

D. Stuart Conger
Director
Occupational and Career Analysis
and Development Branch

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Social Networks and the Gestalt of Help-Seeking*

Benjamin H. Gottlieb Ph.D.
University of Guelph

My theme concerns issues of figure and ground. The figure is the individual who is seeking some outside help in dealing with a personal problem or need, and the ground is the social field in which the help-seeker is embedded. I will discuss the kind of interplay that occurs between help-seekers and their social network, my aim being to provide a better contextual understanding of the help-seeking process. By encouraging you to shift your perspective in a way that makes the client's social ecology more prominent, I hope you will see how profound its impact is on your professional activities. In short, my message is intended to illuminate the varied functions of social networks in the gestalt of help-seeking.

The Help-Seeking Process: An Overview

I want to begin by mapping the terrain that is subsumed by the term "help-seeking". From one viewpoint — the Darwinist view — help-seeking is an ongoing process. It reflects the fundamental reality that we live in a state of interdependence with others and are perenially trying to capture the resources necessary for adaptation and growth in our particular ecological niches. But the help-seeking that *I* want to discuss has to do with discrete instances — when people are exposed to particular life stressors or stressful life circumstances and when they find themselves incapable of successfully dealing with adversity on their own. In these instances, they turn to others who can help them to master or come to terms with their predicament. Thus, I will be concerned with the sort of help-seeking that arises in the context of coping with stress, although that doesn't narrow my discussion much, because stress responses are produced by a host of circumstances that entail threat, loss, harm, and challenge.

What is involved in the process of help-seeking? When people recognize they have a problem, do they immediately sidle up to a trained helper and seek counsel? If those of you who are mental health counsellors have ever asked yourselves why clients wait as long as they do before they avail themselves of your services, you know that they do not seek professional help right away; typically, the client has gone through at least two prior stages in the help-seeking process before reaching your door. And the kinds of influences your client was subjected to in those stages may have either impeded or speeded up your client's arrival.

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*Keynote address presented at the national conference of the Canadian Guidance & Counselling Association. Victoria, B.C., June 3, 1982.

The stage immediately preceding your contact with the client is the stage of referral. In this pre-client stage, the individual somehow got routed to you and then actually showed up. But the very fact that the help-seeker received a referral also implies that he/she was involved in an even earlier stage of the help-seeking process — the stage of diagnosis, when the individual first recognizes the fact that a stressful problem exists, and tries to define it. So the process of help-seeking begins at the stage of problem recognition and crystalization and proceeds to the stage of referral, before professional help is actually extended. However, it is quite conceivable that professionals will not get into the act at all if the help-seeker is influenced in these two prior stages to define his/her problem in a way that rules out professional expertise or to pursue a routing slip that leads elsewhere. Worse yet, a great deal of havoc can result when the clients who do come to see you have all sorts of misconceptions about what to expect from you in the way of help. And this is where my theme of figure and ground emerges. The help-seeker's social network not only influences his/her understanding of the problem he/she is experiencing and determines the path he/she will so take to resolve it, but also conditions the success of the treatment that professional helpers extend to those who *do* reach their doors. But before I turn to the details of the social network's influence on the career of the help-seeker *(see Figure 1)* I wish to convey the meaning I attach to the term, ''social network''.

When defined from the point of view of an individual, the social network consists of all the individual's connections and the connections among those connections.[1] But in our everyday use of the term, we usually have in mind a smaller social aggregate that consists of a person's primary social contacts in several spheres of life. And when we modify the noun ''network'' with adjectives like ''old boy's'', or when we contort our language by converting the noun into a verb — ''networking'' — we usually mean using our connections to gain clout or to exchange resources. We don't wheel and deal any more, we network! I read the theme of this conference in that light. It suggests that this occasion provides you opportunities to revitalize former connections to colleagues, and to make new connections. It also suggests that all this ''networking'' will help you in your work by affording you access to new ideas, by offering varied perspectives on your own ideas and job problems, and by providing you with a supportive reference group that might endure beyond this week and meet your needs for personal and professional development. Conventions provide ideal occasions for watching the process of network formation take place and for looking at the needs that professionally-based networks do and don't satisfy. There is one big difference between the social networks that are represented here and those that I am referring to in the context of the help-seeking process — that is, the network's emotional valence. For the most part, I am referring to networks composed of an individual's close associates, usually peers with whom there is regular contact. They are family members and friends — close attachment figures who are of paramount importance in the individual's affective life and who render the most critical psychosocial resources. A shorthand term for this network that has received wide currency is "support system".[2] But before I talk about the supportive functions of this close social network I want to detail its informal diagnostic and informal referral functions in the help-seeking process.

Stage 1: Problem Recognition and Crystalization

Since the help-seeking process is launched at the stage of problem recognition and crystalization, it is at this point that the social network's case-finding and informal diagnostic functions come into play. Especially when the circumstances of people's lives entail chronic stress, when symptoms of demoralization and psychological strain are insidious rather than florid, people often only become aware of their downward trajectory when they receive feedback to this effect from their closest associates. Workmates are likely to note that one of their number is flagging in his/her work responsibilities, that he/she is absent more often, is more irritable, and prefers to go off on his/her own for lunch rather than joining the group, as was his/her habit. A husband notes that his wife is getting up later each morning, that she seems unable to plan her days in a satisfying way, and that her appetite has become blunted. Members of a high school girl's small clique are quick to recognize their friend's withdrawal from their social activities, her unkempt appearance, and her preoccupation with morbid topics having to do with God, and death, and rebirth. In short, the people with whom we share our lives are often the first to recognize the accumulation of symptoms that signal a departure from normal functioning and they let us know about this through their words and deeds. Of course, many variables affect how quickly our associates will approach us about our "altered state"[3] — their interpretation of what constitutes deviant behaviour and their tolerance of it figure centrally here — but eventually someone from the intimate zone of the network will come forward and express concern. For example, about 90% of teenagers who attempt suicide report a lack of communication with parents, but their peers usually know what's going on.

There are other ways the social network is activated at this first stage of help-seeking, whether or not the individual independently recognizes his/her troubles. The network lends shape to a definition of the problem, it provides alternative accounts of its etiology, it assesses how lethal or severe the problem is, and it offers opinions about the prognosis. In short, it conditions the help-seeker's appraisal of the nature, the probable course, and the consequences of his/her present distress. In so doing, it determines whether the individual will proceed to the second stage of the help-seeking process — the referral stage.

Stage 2: Referral

Entry to the referral stage is predicated on the social network's message that the help-seeker is indeed at risk of further deterioration or cannot regain his/her equilibrium without outside help. This "message" is not necessarily a clear diagnosis of the problem that requires aid; it may not even be a single "diagnosis" — there may be several "messages" transmitted by the network. That is, the help-seeker may have received different messages from different members of the social network about the nature of his/her difficulty in Stage One. But in comparison to whatever buffeting about help-seekers have undergone in Stage One, their experience in the informal referral stage can be nothing short of pinballish. And here again, the social network controls the speed and direction of the help-seeker's course through the maze of turnstiles. It may catapult him/her into a protracted process of referral in which he/she ricochets back and forth between numerous potential helpers; or it may expedite his/her path toward the final target. And along the way he/she may have no contact at all with professional helpers, rebounding instead from one lay resource to another; or he/she may have numerous contacts with professional helpers, each of whom directs him/her to another breed of specialist. And the longer it takes for the help-seeker to reach the final destination where appropriate aid is proffered, the more likely it is that the problem will become more chronic and less tractable.

Thus, when people become aware of a problem, and when they decide to seek help, they don't typically riffle through the yellow pages and let their fingers find a professional. Few help-seekers take a socially independent approach to decision-making about who and where to turn.[4] Instead, they confer with their network, drawing upon its experience and contacts, both to help them sift through the maze of local agencies and private practitioners, and to direct them to other people, who though untrained, possess the experiential knowledge to field their difficulties.

I should note, by the way, that there are some occasions when a person's more casual acquaintances provide better access to needed resources than do

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one's closest associates. In the employment field, Granovetter[5] studied how networks came into play in linking people who were changing jobs. He discovered that the greatest number of new job leads came from an individual's second-order contacts — people who were on the periphery of the individual's network and who, therefore, were likely to move in different social circles and to have access to new information in the environment. Examples would be an old college friend or a former workmate with whom only sporadic contact had been maintained. Here, sometimes it is the weak ties in people's social networks that are really the strongest, because they provide bridges to information and resources in other networks.

You are now in a better position to appreciate the tremendous impact of the social network on professional practice when it acts as a lay referral system. Ultimately, the network regulates the flow of clients to a particular program, clinic or practitioner. Moreover, it not only conditions the help-seeker's service utilization decisions, but it conditions his/her expectations about the kind and character of help which is offered by different programs or practitioners. It screens potential sources of help, it performs a matchmaking function, and it prepares the help-seeker for the kind of response he/she will receive once he/she reaches the helper.

Some years ago, Kadushin[6] illustrated these functions of the social network when he tried to find out how people got to seek certain pretigious psychoanalysts in New York City. Apparently, there are some psychoanalysts in New York who are so classy, so expensive, and so much a part of the intellectual glitterati of the City, that certain people fall over themselves to become their patients. But I am imprecise in saying that people fall over themselves to get in, because, in Kadushin's study, prospective patients were taught by those in the know to present their symptoms to these high-class analysts in a more sophisticated way — to talk about their sexual difficulties, their feelings of lack of self-worth, and their interpersonal ''angst''. Equally important, Kadushin found out that you only learned about these things and got a referral from a current patient by becoming a member of an exclusive kind of social circle in New York, the members of which frequent plays, concerts, cocktail parties and museums — the kind of people the *New Yorker* magazine caters to and depicts in its cartoons. From Kadushin's point of view, this sophisticated social circle was a real boon to these psychotherapists since it recruited and socialized patients flawlessly.

Those of you who counsel a somewhat less glamorous client population may be interested in the research that I undertook for my doctoral thesis.[7] I found that the social networks that exist among high school boys exerted different kinds of ''pulls'' regarding the use of guidance counsellors and other school personnel for help in dealing with their social and emotional problems. My study involved several stages: first, identifying 4 peer subcultures of Senior high school boys; then reliably identifying their members, and, finally, interviewing these boys about the kinds of personal problems they were facing, and their preferences for helpers to deal with those problems. I found marked differences between the groups in their readiness to use school-based personnel as help-sources, and it was clear that peer group norms constrained their preferences. Only one of the four groups seemed positively inclined toward using school guidance personnel for help; ironically, it was the group that didn't need specialized guidance, because it had plentiful access to teachers, school coaches, and other staff, when the need for help arose. Indeed, these students were the cream of the Senior class's crop — I called them "the Elites" — because they excelled in the classroom and on the sports field. They were the ideal citizen-students, just the sort in whom teachers, coaches, and guidance personnel were willing to make an investment. The other groups — the Loners, the Outsiders and the Deviants — all held lower status positions in the informal peer social structure of the high school, and they knew that the school personnel were unlikely to be receptive to their needs for help, except in their narrow and traditional roles. They had arrived at this conclusion gradually, over their four-year term in the school, and it was gained both through their direct contact with these adults and through the messages they received about them from their peers. One of my respondents succinctly summarized the sentiments of the majority of the youth I interviewed in response to a question about guidance counsellors. "Would I talk about my personal problems with the counsellors at school? They're for school-related problems only. It's their role, and I think that's their place." His understanding is that guidance is synonymous with academic planning and scholastic performance, that counselling means deciding about a career direction or a choice of colleges, and that whatever functions are left over have something to do with the way the school hands out discipline and monitors the progress of the student body.

I should note, by the way, that my findings have been confirmed in larger scale studies both in Canada and the U.S.[8] Only 10-15% of the student body feel comfortable approaching school counsellors about their personal problems and a miniscule number actually do so. Students simply don't open up to counsellors about family hassles and personal doubtings and all the other turmoil that we read about adolescents experiencing. Now, we may never be able to influence high schoolers to send more referrals our way, but we can find out more about the kinds of help that students prefer to use and then try to develop and optimize those resources.

Stage 3: Help-giving

In fact, there *is* one helping resource that the vast majority of high schoolers do talk to about their fears and anxieties — other high schoolers. In order to talk about this type of helping resource, I want to shift from my analysis of the social network's role as an informal referral system to its role as an informal support system. The family members and close friends who served as consultants during the first and second stages of the help-seeking process also form a lay treatment network whose helping resources are usually tapped before any more distant and costly helping resources are engaged. People try to work out their problems within the confines of their primary group for a number of reasons: partly because it is accessible; partly because there is no stigma associated with this therapeutic avenue; partly because it expresses another basis of reciprocity in this intimate zone of interaction; and partly because it reaffirms the "psychological sense of community" that people value and yearn for. All of these reasons help us to understand why most people first approach their own "personal communities" to resolve their difficulties, rather than going to professionals. Indeed, why would anyone who is experiencing feelings of estrangement, approach a stranger for help? Only if he/she is socially isolated or believes that this stranger has the special skills — the magic bullet — or controls access to extra resources that the state can provide to resolve the problem. And I think the tendency of professionals, especially professionals in the mental health field, to oversell their particular brands of therapeutic elixirs, has simply created more public skepticism about the value of attending professional services.

The fact that high schoolers overwhelmingly prefer to talk to their peers about their personal problems is entirely consistent with numerous studies among adults that testify to their use of informal helping resources. Over twenty years ago, Gurin, Veroff and Feld[9] conducted their nationwide survey of a stratified random sample of U.S. households and reported in their book, "Americans View Their Mental Health", that people typically disclosed their personal problems and periods of unhappiness to social intimates. Their research also showed that, aside from family members and close friends, there were other informal helpers who carried large "caseloads": family physicians, members of the clergy, and teachers, people whose normal work roles brought them into repeated contact with citizens and who came to be trusted and relied on as sources of emotional support. Similar findings regarding the extensive use of community caregivers have been reported in Quebec by Roberts et al,[10] and by Wright et al,[11] in British Columbia. Apparently, the healing roles of physicians and clergy easily generalize from the spiritual and medical domains to the emotional domain; and there is no question that the confidentiality of disclosures made to them would be honored.

In Rochester, New York, Cowen[12] and his colleagues have taken a closer look at the informal helping activities of other types of community caregivers. Some of them are in great demand these days, like divorce attorneys and bartenders; and some of them have probably always been doing a lot of listening to people's problems, like hairdressers and taxi drivers. The hairdresser data are particularly fascinating. The 90 hairdressers Cowen and Company interviewed see an average of 55 customers per week, averaging 46 minutes with each one, of which 25 minutes are spent talking. Approximately one-third of the talking time is devoted to discussion of moderate-to-serious problems typically concerning children, health, and marriage . . . The researchers also found that the hairdressers were interested in participating in training workshops aimed to upgrade their helping skills and a prime reason for their interest can be easily gleaned from the following comments of one hairdresser:

> To be perfectly truthful I regard myself as a B-hairdresser. But my business is booming. Mostly that's because I listen to people, care about their personal concerns, and try to be helpful. The guy down the street is really an A-hairdresser — one of the best in town. But he's going to go out of business because he can't stand people and is incapable of listening sympathetically to *anyone's* problems.[13]

For hairdressers, being a good helper is a good help to business. The same viewpoint came through in interviews with another group of caregivers — industrial foremen. By providing supportive supervision to their subordinates, they had less absenteeism and better quality production.

So family members and friends, and sometimes one or more of these informal caregivers make up much of what I refer to as the lay treatment network or support system that provides feedback about the appropriateness of our feelings and behaviours and gives us a reliable sense of alliance. But for increasing numbers of people another sector of their social network forms the centerpiece of their support system. It represents the most organized and visible aspect of their lay treatment network and has drawn a lot of attention from the media as well as from the professional health and human services guilds. I am referring to the self-help movement, and surely it deserves the designation of a movement. Name a noxious habit, an addiction, a compulsion, a phobia, a chronic health condition, or just a pedestrian type of neurotic affliction, and a group has been formed to help its sufferers. While estimates vary, most chroniclers of the self-help movement close in on the figure of half a million separate self-help groups in North America, embracing several million participants.[14] Alcoholics Anonymous alone had 27,000 chapters in 1976. And groups have also been formed to help the people who love or live with someone who has one of these afflictions. The most obvious examples of these "one step removed" groups are those composed of parents whose kids have run away, or suffer from a particular disease, condition, addiction, or an emotional problem. In Canada, the national "Participaction" campaign has extended to the self-help field, and funds have been provided to develop local directories of all self-help groups.

Obviously, "self-help" is a movement whose time has come. People want to exert some personal control over immediate problems since the larger aspects of their lives are controlled and regulated by big government and impersonal bureaucracies. And, just as important, the movement's popularity clearly reflects people's specific dissatisfactions with the way the health and human services system treats them or with its failure to address the psychosocial needs surrounding their conditions. More and more people are joining in after being contaged by the feelings of empowerment that members express, and there *is* something empowering about the experience of effecting change in oneself and others when one's only experience in the past has been as the target of someone else's change efforts. There's also little doubt that for a lot of people, participation in self-help groups provides an antidote to feelings of isolation, and does, in fact, expand their social network. Indeed, many self-help groups have adopted strategies to foster the integration of the participants in one another's ongoing social networks. They meet in each other's homes, they encourage members to call each other and get together outside the formal group sessions, they invite family members periodically, and they assign sponsors to new members who develop an especially close relationship with them. As self-help group members are gradually grafted onto the individual's network the boundaries between the primary group and the support system are no longer distinguishable.

Thus far, I have discussed the composition of the lay treatment network — the people who are sought out for help and comfort during times of stress, and I have identified three categories of potential informal helpers: family members and close friends, a set of community caregivers, and a set of people who we perceive as similar peers because we are "in the same shipwreck" together and must rely on our mutual-aid to keep ourselves afloat. However, I have yet to discuss what transpires in the lay treatment network, how it accomplishes its stress-reducing functions, what therapeutic provisions it offers. Hence, I will deal next with the substance of social support, and then reintroduce my theme of figure and ground by commenting on the ways in which the social network can affect the success of our work with clients.

On the Nature of Social Support

My study of the adolescents' helping preferences provided the first clues about the nature of the support that the lay treatment network offers. After my respondents had identified the people they preferred to talk to about their personal problems, I asked them about the reasons for their preferences. I asked them to tell me what these people said, or did, or gave them, or what it was about these people that made them attractive helpers. Some of their answers provided meaningful insights into the nature of informal support. This is what one of the "Elites" said about his coach:

> My coach has done everything for me — got a job for me, gave me advice during football and stuff like that. Helped me extra. You can always count on him to give you some pretty good advice. He'll give you both sides, but he'll tell you what he thinks is best for you. He knows me, too. I mean, that's a different thing. He's seen me in action, I guess.

From the help-seeker's viewpoint, the features of informal support that shine through here are: receiving practical aid; the emphasis on being able to count on someone; knowing that someone is treating you uniquely; and having someone give you different perspectives on a problem, although in this case, the coach ended with a specific recommendation that he felt was best for the boy. Another youth pointed out the value of the helper's own prior experience with a problem the youth now faced, when he says: "I'd just rather go to somebody who knows a little bit more about the situation . . . gone through that time and can look back and give you the best advice." A third comment comes from one of the members of the "Deviant" subgroup who told me something about the role-bound nature of his interactions with most adults which prevented him from disclosing intimacies to them:

> Well the people who know me really well are really close . . . the others are people you try to put up a front for . . . like a teacher . . . to get a better grade; your kin . . . to make your parents look good; your family doctor . . . just be healthy; a boss . . . you're always kind, precise and polite around him. These people make me a more outgoing person, like friendly. But it's kinda like a front.

These comments about the nature of informal support whetted my scientific appetite for more detailed and comprehensive information about this topic. The first major study I subsequently undertook was therefore devoted exclusively to informal support.[15] But I decided to choose a very different sample for this inquiry — a sample that would allow me to compare the character of the support provided by people's social networks to the support extended by professional helpers. Working through the local welfare office, I contacted and interviewed 40 sole support mothers who described to me the ways in which a variety of lay and professional helpers provided support for the life stresses they faced. The interviews were conducted and tape-recorded in their homes, and later transcribed. The material about the types of support they received was then content-analyzed by a team of 4 raters. The results of that analysis have been formed into a classification scheme of informal helping behaviours *(displayed in Table 1)*. I will review some of its most noteworthy features. In particular, I wish to highlight the points of overlap between lay and professional help and the categories of support that seem to be unique to lay helpers.

A lot of the overlap exists in the first class ''A'' of emotionally-sustaining behaviours. Categories A4 to A8 closely match the sort of core skills that are emphasized in the classic client-centered counselling literature. Three of the categories, A10 - A12, converge with the processes that Goodman[16] says lie at the heart of companionship therapy. Those of you who are employment counsellors and have seen your clients come back day after day always in the company of one or two associates can see in Category A11 that their presence constitutes a form of social support. The first several categories in the second class of problem-solving behaviours also coincide with professional helping tactics, but the latter half were rarely used to describe the way professionals extended support. Category B7 is particularly interesting because it has been the focus of much literature about the social network's influence on patients' compliance with therapeutic regimens that have been set for them, a point I will return to shortly. Category B9 is a supportive behaviour that lies at the heart of the helping process in mutual-aid groups. And Category B10 came up over and over and is probably the most fundamental kind of informal help among low-income respondents. In fact, in today's bleak economic situation, we are seeing the emergence, especially among the unemployed, of a barter economy wholly rooted in the sort of helping exchanges typified by Category B10.

The two categories subsumed under the third class, ''Indirect Personal Influences'' are not helping behaviours, nor are they really qualities of the helper in the same way that trust and respect *are*. I believe they reflect something I referred to earlier as a ''psychological sense of community''[17] — a sense of security that certain people in one's network and certain resources they have are forthcoming when they are needed. So even though they are not helping behaviours, I felt these two categories of support ought to be represented because I had no doubt that my respondents were sustained by the knowledge that their close associates would come through when it really mattered. Finally, I think category D1 ought properly to be placed in a category of its own because it is a form of advocacy that people perform for each other, often without the helpee even knowing about it. At work, when one employee runs interference for a co-worker by cooling off the boss or by taking up some of the work overload or when a grandparent gives you that much needed respite by taking over the kids for a weekend — an evening? — that's the kind of help that helping's all about.

The classification scheme illuminates the spectrum of behaviours, qualities and information that can signify social support to people. Of course, different people will have different preferences for the types of support they can use, the occasions on which they will call for social support, and the people they feel comfortable engaging for social support. Further, the classification scheme does not speak for the effectiveness of these various kinds of social support. I certainly do not intend to convey the impression that the lay treatment network possesses some sort of native wisdom about how best to combine all these resources on behalf of the help-seeker. More generally, I do not want to instill the idea that the support systems provided by people's social networks are some sort of "emotional Jaccuzis" that never break down and always offer solace for people's troubles. Rather, my point is that people's help-seeking efforts are grounded in the social network right from the start and that, compass-like, it points them to resources within and outside its boundaries and reasserts its influence through all the stages of the help-seeker's career even when the help-seeker is in professional treatment. Though I've spent a good deal of time emphasizing the ways the social network can cause the help-seeker to by-pass the professional — by influencing the help-seeker to define his/her problem in a way that rules out the use of professional resources; by referring people to informal helpers; and by directly meeting people's needs for support and guidance, the fact remains — no doubt you are often painfully aware of this — that many people avail themselves of professional help.

Even when the help-seeker does use professional services, the social network is part of the audience to which the professional plays. It either gives its nod to or contradicts the professional's diagnosis of the help-seeker's problem; it undermines or reinforces the problem-solving actions recommended by the professional; and ultimately, it has the power to yank the help-seeker out of the professional's enterprise and back onto its own turf. Witness the staggering figures on clients who drop out of treatment and who fail to comply with treatment regimens.

Implications for Professional Practice

My discussion of the social network's role in mitigating stress raises several questions about the support we exchange with others in our roles as human service professionals. Do our relationships with workmates, supervisors, and subordinates satisfy our needs for support? How do we meet *their* needs for support? How much do differences among our colleagues' personal values, statuses, access to resources, and philosophies about how to work with people get in the way of supportive exchanges with one another? And does the structure of our organizations set limits on opportunities for exchanging support? Do we have to bootleg support over lunch or during coffee breaks or do our organizations build it in as a legitimate work activity? Do staff meetings or case conferences provide occasions for personal or professional growth? Do they give us a chance to air our work-related concerns or do their agendas and their patterns of interaction stifle the expression of social support?

Our answers to all of these questions are crucial because the support we give and get concerning our work will affect the energy and commitment we bring to our work. What I'm really driving at here is an issue that human service professionals are talking about more and more these days, namely their feelings of job burnout — a sense of disillusionment and demoralization about helping people. And whether we call it burnout or smoulder-out or just plain old tedium on the job, this debilitating condition stems in large part from the absence of genuine support in the professional's workplace.

However, the pervasiveness of the burnout phenomenon in the human services may have less to do with the structural features of our workplaces than with the norms that are subtly inculcated in the process of professional socialization for human services work. Support in our workplace may be a scarce resource because we have been taught to believe that we should place the highest premium on autonomy and independent decision-making — a bootstrap sort of ethic. Furthermore, support may be scarce because we believe that asking for and giving support implies weakness and violates another sacrosanct norm: that we professionals are all of equal status. That is, when someone requests support from someone else, do we believe this automatically confers a lower status on the helpseeker and elevates the status of the helpgiver? Glidewell, Todt, and Tucker[18] at George Peabody College for Teachers in Nashville discovered that these support-reducing norms operated very strongly among teachers. Teachers never actually come right out and request or offer support to one another for their work problems because these norms of autonomy and equal status relationships constrain them from doing so. Instead, they exchange support in a more indirect way — by swapping experiences. One teacher tells his/her "war story" to another, and he/she responds, in turn, by showing his/her battle scars; and by hearing about the second teacher's experience, the first gains some help and support. At the same time, both parties come away from this interaction feeling that their autonomy and equal status have not been threatened. It is paradoxical that those of us in the helping professions feel so conflicted about helping in our own lives.

A second issue that is provoked by my discussion of networks as support systems bears more directly on the work we do with our clients. Especially in the mental health field, we have concentrated so exclusively on assessment of the person and his/her psychological life that we have ignored the social network in the individual's life space. We have lost sight of Kurt Lewin's simple equation that behaviour is a function of the person and the environment and our forgetfulness robs us of a whole set of potential interventions that use the environment to effect changes directly or to enhance the effects of the changes we instigate. On the latter score, in order to increase the chances that our work will be ecologically sound, at the time of intake we can at least inquire into the network's informal diagnostic and referral functions. We can ask clients what their network members think has caused the problem, how serious they think it is, whether they think it will take a long or short time to get over, and how they feel about the client continuing to see a professional. Later, we can also monitor the network's reaction to the plans, methods, and goals we adopt with our clients by asking such questions as "What do they say about your progress so far? What are they doing or saying to help you change in the ways we've talked about? Do they think we're on the right track about your problem and how to deal with it?" These sorts of questions provide valuable information about the network's model or definition of health. They also demonstrate to clients our concern about the impact of what we do on their relationships with significant others; and, fundamentally, they signal our recognition that effective professional help must be integrated with the lay system of care.

In addition when we attend to the environment in the client's life space we can design interventions that directly mobilize the social network as a support system. Recall that earlier I talked about people drawing upon their second-order or weak ties to find new jobs, and I commented on the role of mutual aid groups composed of similar peers in helping people deal with stress. Those ideas can be translated into support-mobilizing interventions like job clubs that bring unemployed people together not only to swap information about useful job leads, or to exchange ideas about job search strategies and interviewing skills, but also to provide support and bolster one another's feelings of esteem during this difficult time. More generally, professionals can help to set up support groups among two types of client groups. First, they can identify people in similarly stressful circumstances and bring them together in support groups that germinate within an agency or clinic setting and then are transplanted in the community where they can continue to function autonomously. Second, professionals can help to identify people who are undergoing certain types of life events or life transitions that entail the loss of significant sources of support and then help to reweave them into a new supportive social fabric. Some obvious examples come to mind. Counsellors employed in industrial or military settings should pay special attention to individuals and families who face relocations to new geographic communities, with the attendant loss of social ties, or they can develop support groups among employees who face retirement, or among those who have ended their term of military service and are trying to plan their transition to a new civilian career. In educational settings, transfer and foreign students may be particularly at risk because they lack a viable support network and desperately need some sort of social anchoring in an environment that is totally novel to them. Moreover, the entire experience of immigration — the process of making a new niche for oneself in a social and cultural environment and getting hold of the resources necessary to adaptation — can proceed more or less smoothly depending upon the institutional and informal support systems that are available. We have worked hard on this issue in Canada. We have not insisted that everybody fit a single mould, and in our respect for cultural diversity, we have managed to preserve the informal support systems that sustain different groups.

My general point is that there are life events that can have a very damaging effect on people — events like widowhood, job termination, and marital separation, or from the children's point of view, parental divorce. These events have one common property — the loss of significant attachment figures; and these sorts of crises are the most difficult for people to handle precisely because, by their very nature, they deplete the individual's social field of its most intimate and dependable social bonds. We need to become more active in reaching out to people who have suffered deep rends in the social fabric of their lives and knit them into networks that offer new peer attachments.

I conclude by returning to the theme of figure and ground. In everything I have said about the social context in which help-seeking occurs, I have been driving at one idea — that the individuals to whom we extend our guidance and counselling are fragments of networks. When we approach them from this perspective, the work we do will be more closely attuned to the way people actually live their lives and more responsive to their needs for informal support and a sense of community.

Figure 1: Social Network Influences on the Help-Seeking Process

Career Stages	Characterized by Such Questions as:	Lay Influences Originate From The:	Types of Lay Influence
1. Problem Recognition and Crystallization (Client Case-Finding)	—Is something wrong with me? —Is it serious? —What's the problem?	Informal Diagnostic Network	—detects accumulation of symptoms of distress —lends shape to a definition of the problem —provides alternative accounts of etiology —assesses "lethality" or severity of problem —discusses prognosis —reacts to professional opinion and diagnosis
2. Referral (Client Recruitment)	—Where should I go for help? —What sort of help do I need? —What are the costs of using different services?	Informal Referral Network	—conditions expectations about professional treatment —speeds or delays use of professional treatment —provides "routing slips" to informal sources of help
3. Help-Giving (Client Treatment)	—Am I on the road to recovery? —Do I feel better about myself and my situation? —How actively am I sharing in this healing experience?	Informal Support Systems a. self-help groups b. kith & kin c. neighborhood helping networks d. community "gatekeepers"	—provides verbal, material and action-oriented help —undermines or reinforces professional treatment —provides a "psychological sense of community" —moderates the effects of stress

Table 1: A Classification Scheme of Informal Helping Behaviour

ategory	Definition	Example
. EMOTIONALLY SUSTAINING BEHAVIOURS		
.1 Talking (unfocused)	Airing or ventilation of general concerns without reference to problem specifics	"she'll talk things over with me"
.2 Provides reassurance	Expresses confidence in R as a person, in some aspect of R's *past* or *present* behaviour, or with regard to the future course of events	"he seems to have faith in me"
3 Provides encouragement	Stimulates or motivates R to engage in some *future* behaviour	"she pushed me a lot of times when I was saying, 'oh, to heck with it' "
.4 Listens	Listening only, without reference to dialogue	"he listens to me when I talk to him about things"
.5 Reflects understanding	Signals understanding of the facts of R's problem or of R's feelings	"she would know what I was saying"
6 Reflects respect	Expresses respect or esteem for R	"some people look down on you; well, she doesn't"
.7 Reflects concern	Expresses concern about the importance or severity of the problem's impact on R or for the problem itself	"just by telling me how worried or afraid she is" (for me)
8 Reflects trust	Reflects assurance of the confidentiality of shared information	"she's someone I trust and I knew that it was confidential"
9 Reflects intimacy	Provides or reflects interpersonal intimacy	"he's just close to me"
10 Provides companionship	Offers simple companionship or access to new companions	"I've always got her and I really don't feel alone"
11 Provides accompaniment in stressful situation	Accompanies R in a stressful situation	"she took the time to be there with me so I didn't have to face it alone"
12 Provides extended period of care	Maintains a supportive relationship to R over what R considers an extended period of time	"she was with me the whole way"

Table 1: A Classification Scheme of Informal Helping Behaviour

Category		Definition	Example
B. PROBLEM SOLVING BEHAVIOURS			
B1	Talking (focused)	Airing or ventilation of specific problem details	"I'm able to tell him what's bugging me and we discuss it"
B2	Provides clarification	Discussion of problem details which aims to promote new understanding or new perspective	"making me more aware of what I was actually saying other than just having the words come out"
B3	Provides suggestions	Provides suggestions or advice about the means of problem-solving	"he offered suggestions of what I could do"
B4	Provides directive	Commands, orders, or directs S about the means of problem-solving	"all Rose told me was to be more assertive"
B5	Provides information about source of stress	Definition same as category name	"she keeps me in touch with what my child's doing"
B6	Provides referral	Refers R to alternative helping resource(s)	"financially, he put me on to a car mechanic who gave me a tune-up for less than I would pay in a garage"
B7	Monitors directive	Attempts to ensure that R complies with problem-solving directive	"making sure that I follow through with their orders"
B8	Buffers S from source of stress	Engages in behaviour which prevents contact between R and stressor	"he doesn't offer it (alcohol) to me anymore"
B9	Models/Provides testimony of own experience	Models behaviours or provides oral testimony related to the helper's own experience in a similar situation	"just even watching her and how confident she seems has taught me something"
B10	Provides material aid and/or direct service	Lends or gives tangibles (e.g. food, clothing, money) or provides service (e.g. babysitting, transportation) to R	"he brought his truck and moved me so I wouldn't have to rent a truck"
B11	Distracts from problem focus	Temporarily diverts R's attention through initiating activity (verbal or action-oriented) unrelated to the problem	"or he'll say, 'Let's go for a drive' . . . some little thing to get my mind off it"

Table 1: A Classification Scheme of Informal Helping Behaviour

Category		Definition	Example
C. INDIRECT PERSONAL INFLUENCE			
C1	Reflects unconditional access	Helper conveys an unconditional availability to R (without reference to problem-solving actions)	"she's there when I need her"
C2	Reflects readiness to act	Helper conveys to R readiness to engage in future problem-solving behaviour	"he'll do all he can do"
D. ENVIRONMENTAL ACTION			
D1	Intervenes in the environment to reduce source of stress	Intervenes in the environment to remove or diminish the source(s) of stress	"she helped by talking to the owners and convincing them to wait for the money a while"

From Gottlieb, B.H. The development and application of a classification scheme of informal helping behaviours, *Canadian Journal Behav. Sci.*, 1978, 10(2), p. 105-115.

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Theory and Practice of Peer Counselling[*]

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Abstract

The rationale, origins and practice of peer counselling, a system of training people to help each other through empathy and decision making, are detailed. Specific applications are described, with particular attention to involving adolescents as peer counsellors. The author takes the view that teenagers have been virtually ignored as a source of positive help to other teenagers and that teenagers can be trained to help others make effective decisions spanning nearly all aspects of their development. Peer counsellor training as practised by the Peer Counselling Project located within the University of Victoria is described in extensive detail.

For most school counsellors, students are primarily clients who require services in academic, personal-social and career areas. Students are usually seen individually or in groups and are passive recipients of counselling services. Until recently students have been ignored as a resource able to provide assistance to fellow students. In fact, peer culture itself is often seen as a powerful negative force in need of adult control and management. However, without the active help of students in resolving their own psychological problems and crises of human development, it is unlikely that counselling programs or services will be successful or effective. Instead counsellors must engage students as cooperative allies and abandon attempts to win students over through reason or logic. In addition, counsellors must accept the influence power of the existing social network and learn how to enhance the foundations and purposes of the network. Counsellors must also recognize the skills, needs, and behaviours which already are part of a student's repertoire and build on these. Counselling services, then, cannot continue to mold, shape or force students to fit a model of professional delivery which is alien to the culture it is attempting to serve. Instead, the counselling service must be based on a thorough understanding and use of the factors influencing student development.

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Programs or approaches using these developmental ideas are beginning to emerge and gain credibility. Peer tutoring (Allen, 1976), positive peer culture (Vorrath and Brendtro, 1974) and peer counselling (Carr, 1980; Myrick and Erney, 1978; Varenhorst, 1974), are examples of interventions which draw on principles of development and the values of the existing student network.

Peer counselling can be used at many age levels to attend to a variety of problems such as drug and alcohol abuse (Samuels and Samuels, 1975), stress management (Walley, 1980), teenage pregnancies (Foster and Miller, 1980), loneliness (Carr and Saunders, 1979), friendship (Varenhorst, 1978), and widowhood (Romaniuk, Priddy and Romaniuk, 1981). Since it can easily be extended to a variety of other areas such as vocational and career development, the purpose of this article is to describe the origins of peer counselling, illustrate the training model of peer counselling as developed by Peer Counselling Project at the University of Victoria, and relate examples of how peer counselling is practised in school settings.

What is peer counselling? Basically peer counselling is a way for students to learn how to care about others *and* put their caring into practice. It relies strongly on communication skills to facilitate self-exploration and decision-making. Peer counsellors are not professional counsellors or therapists. They are students who provide supervised assistance to other students to help think through and reflect on concerns they might be experiencing. A trained peer counsellor who is recruited from a core social network can have numerous informal and spontaneous contacts thus multiplying their impact on a variety of other students. These contacts can enhance the climate of the school and can act as a bridge between professional counselling and students who will not see school counsellors.

Peer counselling is a deliberate and systematic form of psychological education. It enables students to have the skills to implement their powerfully experienced valuing of autonomy and control. By focusing on the process of thinking, feeling and deciding, rather than evaluating specifically the content, it contributes to the most powerfully experienced need of adolescents: respect. The peer counsellor is trained to provide a nonjudgmental listening posture which encourages others to express and explore their concerns, worries or frustrations. This exploration often prevents self-destructive or other acting-out behaviours by encouraging a student to talk with someone who listens, or "has been there" or can empathize.

Some persons have expressed concern about the word ''counsellor'' being applied to teenagers, and are worried that the term has professional connotations. Various programs have accommodated this idea by calling their trained students by some other titles such as peer facilitators, junior counsellors, counsellor aides or buddies. The importance is not in the title but in how the students relate to other students, and the way in which these relationships can be used to enhance their development.

What are the origins of peer counselling? In order to understand the training and program operations of peer counselling it may be useful to briefly explore the nine foundation areas which have significantly contributed to its creation and led to its natural development.

Over the past few years, a number of large-scale evaluations of school counselling have taken place across Canada (Carr, 1978; Guérette, 1981; Haughey and Bowman, 1980). While these studies had somewhat different purposes, were conducted with a variety of student populations and used differing survey instruments, some of their conclusions are remarkably similar: only a minority of students ever go to see counsellors and that most students, when they are experiencing some kind of personal concern rely primarily on their friends as sources of help. With only minor changes in percentages these findings hold true regardless of age level, quality of counselling available, or experience in working with a counsellor. Similar studies conducted in the United States (Prediger, Roth and Noeth, 1974) have demonstrated the same results; namely, that friends remain the number one in-school resource for students considering personal decisions, job plans, and how far to go with formal education.

A second foundation for peer counselling comes from research on the helping relationship itself (Carkhuff, 1969; Egan, 1975; and Ivey, 1971). The skills associated with effective helping have not only been described and demystified, but have also been shown to be learnable by a variety of lay persons, including paraprofessionals (Carkhuff, 1969), high school students (Carr and Saunders, 1979), junior high students (Carr, McDowell and McKee, 1981) and elementary age students (Bowman and Myrick, 1981). The training itself can also serve as a form of treatment and the peer counsellors enhance their own development and psychological growth. An important implication of helping skill research is that the skills are not only helpful, but can be taught to younger persons so that they can be used within the youth culture. While a number of recent therapy advances appear promising (neurolinguistic programming, for example), it is unclear as to whether young people can learn to use these approaches.

Across North America high school students have responded to surveys designed to assess what they see as the major problems confronting youth today (Carr, 1980). The results, which serve as the third foundation block, consistently reveal that loneliness or making and keeping friends are either the highest or among the top five concerns of young people. These self-reported rankings often differ remarkably from adult rankings of what adults perceive as the major problems confronting youth. This difference is an example of potential "generation gap" which may prevent students from seeking help from adults.

More seriously, even though friendship concerns occupy a major proportion of students' time, and as Rubin (1980) has stated, are often the sources of greatest pleasure and deepest frustration, social scientists have paid virtually no attention to them. It is likely that friends can help each other learn things that are unique and cannot be taught by parents or educators. Debilitating conditions at home can often be neutralized through involvement with peers in school (Rubin, 1980). Contrary to popular opinion, friendship patterns do not remain stable within the school context, and it appears that the purposes of friendship change as students get older. Senior high students describe a friend as a person who listens, helps and communicates in depth. Friendships are characterized by *mutuality* or a willingness to be helpers to each other.

Many teenagers have already learned how to make friends and they remain quite popular with their peers, even though sometimes not liked by their teachers. These students have acquired certain skills such as being attentive and supportive, able to manage conflicts appropriately, ability to be sensitive to others and express thoughts and ideas in ways that others do not feel their esteem is threatened. And while knowledge of how to make and keep friends can contribute to success, it is only secondary to an ability and willingness to use the skills in a practical way. Students who possess these skills are more often than not unaware of what they actually do on a conscious basis. These students when involved in reflective-oriented training can learn very easily how to teach others to do what they do to make and keep friends.

The fourth basis for using students to help other students comes from the emphasis on primary prevention (Albee and Joffe, 1981) within the mental health movement and the application of preventive counselling (Carr, 1976) within school settings. Prevention programs have a two level thrust: the need to strengthen (or immunize) students against harmful influences (by providing skills in resolving problems more effectively) and at the same time reduce the incidence of psychologically destructive factors within the environment (eliminate an uncaring environment, for example).

Student needs for competency (to be strong), intelligence (not academic, but to know the scene, keep from getting conned), responsible role taking (to be respected) and self-esteem (to be valued and understood) form the basis for foundation five. Students recognize how powerful these needs are and often direct their best-shot, put down comments in these directions: "baby, boring, suck, dumb, stupid, weird, retard"; and their best compliments as: "fox, Mr. Macho, cool, got-it-together". Adults often react to the superficial manifestations of these needs with patronizing, scornful or disrespectful behaviour (often with the intention of "helping"), but the students, being intensely sensitive to the needs will retreat further, fight back or become self-destructive. They generally turn to other students who have shared similar embarrassing, humiliating or need ignoring experiences *and* who listen, not to approve or disapprove but to accept and understand. Research and knowledge about human development closely parallels student needs and serves as the sixth foundation. A key issue in adolescence is independence, but as Ivey (1977) has pointed out, it is important to understand independence in relation to peer culture perspectives. For example, Coleman (1980) has discovered that for teenage boys, independence means freedom from constraint, the freedom in life to become what one wishes; whereas for girls independence means internal freedom, or the opportunity to be one's self and to have some autonomy with respect to one's feelings and thoughts.

Adolescence has also been described as a time of identity seeking, using Erikson's terms, securing identity and avoiding identity diffusion. Yet all too often counsellors have assumed this time to be a teenager's search for the "real self", when, in fact, it is less of a time when one *finds* oneself and more of a time when one *makes* oneself. It is the daily interactions and experience (or lack of) with fellow students which shape the self perception more dramatically than any amount of self-reflection or intelligence.

Despite the glut of textbooks on adolescent development, very little is really known about individual differences among teenagers. For example, as a developmental specialist, it is clear to me that the power of the peer group is not only greatly misunderstood but also grossly exaggerated. This is perpetuated by adults seeing all teenagers as the same and ignoring the developmental process which experiences important changes and differences in friendship, group memberships, motivation and values. Counsellors may be particularly insensitive to the social evolution of the peer group or cliques and tend to overrate their impact and influences as well as misunderstand their constructive role.

The effects of peer tutoring peers (Allen, 1976; Gartner, Kohler and Reissman, 1971) has received considerable attention and serves as another foundation block. Generally, the research on tutoring supports the value of using peers to improve the achievement and esteem of other students. Research has suggested that tutoring is as helpful for the tutor as for the tutee

(Chandler, 1976) and that student-tutors may surpass teacher-tutors in tutoring some students (Karegianes, Pascarella and Pflaum, 1980). In addition, many students prefer to learn from peers and evidence gathered by Price (1980) on student learning styles indicates that students are less teacher motivated in the higher grades and that low motivated, learning disabled students are more likely to be peer oriented. Research by Shaefer (1980) and Condry and Siman (1980) has revealed that peer oriented students become dependent on the peer group not by choice but by necessity because of a lack of attention and affection at home. This shift occurs around sixth grade, and is followed by pre-delinquent behaviour in grades seven and eight.

The increasing establishment of self-help (Romeder, 1981) or mutual aid groups (Peavy, 1978) provides the eighth origin for peer counselling. Basically, these groups are formed by peers whose mutual needs are often unmet by existing services or who are unable or unwilling to use available institutions. They meet to address shared or common concerns and often rely on the relationships of members to members to resolve problems, using support and catharsis as a problem-solving intervention. Probably the most famous and most successful (in terms of longevity, participation and outcomes) is Alcoholics Anonymous. Women's groups, weight watchers, cancer patients, family groups, single parents, Parents of Murdered Children are just a few additional examples. Adolescents have formed their own mutual aid groups, yet the positive, coping functions of these groups to assist in the healthy development of teenagers has virtually been ignored for the more sensationalist negative or conflict producing behaviours. While we have no formal research to support our observations, it appears that kids aged 8 to 12 are also tending to form groups or mousepacks, thus indicating an earlier age for peer orientation.

Finally, the last foundation for peer counselling is based on manpower supply and costs. The historic 1961 report of the Joint Commission on Mental Illness clearly specified the need to improve community resources rather than on spending extensive funds on professional training. Despite increases in professional personnel and advances in effective therapeutic interventions, the problems of teenagers continue to outpace the growth and availability of formal help. Skyrocketing costs for services, unmanageable case loads and long waiting lists, growing cynicism about the skills of professionals, and frightening statistics about adolescent death and disability, violence and depression require the enlistment of adolescents themselves in helping each other. Students generally know much sooner than adults when another student is experiencing trouble, and can be in closer more spontaneous contact. Peer counsellors supplement existing counselling services, and can free counsellors to work with or refer seriously troubled students. Peer counsellors can also serve as a bridge to get a troubled friend involved in professional help.

The Peer Counselling Model. Having examined the foundations of peer counselling we can now turn to how programs are organized, what is involved in training, and how students work with other students.

As with any successful innovation it is important to develop a strong practical foundation upon which the program can rely. We begin by assessing the needs of the client population (using surveys, interviews, observations, etc.) to determine whether peer counselling is the most appropriate or highest priority intervention for improving student psychological health. We also enlist the support of parent groups, teaching staff, etc. by forming advisory committees or having them involved in the training. While counsellors appear to be the most likely persons to run or organize peer counselling, they are often unavailable or highly reluctant. Involving non-counsellor personnel is often beneficial because it encourages and supports the helping interests of other persons within the school context. Parents are often the most enthusiastic group, and have quickly seen the value of improving the quality of student to student help.

We also ensure that the objectives for the program are clear and written out. In addition, we assess the training skills of the trainers and provide training courses for persons interested in training students. We began by training the students ourselves, primarily to ensure that our training approach was appropriate for adolescents. Having satisfied ourselves that it was, and having trained a variety of different groups, we realized it would be more efficient and impactful for us to train others to do the training and then remain available to consult with them on problems they encountered.

The final element of the start-up process concerns thinking through trainee selection procedures, preparing a systematic model of training and creating an approach to evaluation. The next steps after building the foundation are recruiting and selecting students, delivering the training itself to small groups, providing supervised assignments, and supervising the program itself. Since these areas have a strong practical base and because we have been asked a number of times to respond to questions in these areas, each of them will be detailed here.

Recruiting and Selection. Since peer counselling is based on the well-documented evidence that peers seek help from peers, it is clear that many students are already providing some kind of help to other students. For training purposes it is helpful if these students can identify themselves through requests for *volunteers* who are interested in counselling or helping. We generally ask two questions to help volunteers become interested: "have you ever tried to help a friend, but didn't know what to do?" and "do you know what it's like to have worries, concerns, frustrations?" In addition to seeking volunteers, we encourage *students to nominate other students* and *staff to nominate students* (sometimes these nominations are quite different from each other). We also ask *parents* and from our *observations* of students in the school we nominate potential students. Finally, we encourage the use of *empirical nominations* which can serve as both identifying and verifying activities. Examples of such approaches include sociograms (who talks to whom), class play, techniques ("who would you choose to play the role of a people helper in this play?"). We also identify using student vernacular, what are the social groupings in the school (for example, "heads, greasers, sucks") and ask if they know people who fit in more than one group. Actually we draw circles on a blackboard representing each of the groups students identify, and we show the circles intersecting, so that at one point all the circles overlap (part of our definition of a network), and ask the students who they know that would fit into the intersections. We then will make written and personal requests of the student names received from a variety of nominations and together with the volunteers hold an information meeting. The meeting is advertised through bulletins, announcements, word-of-mouth, posters, lunches, staff meetings, speakers program and in-class recruiting. Once a program has been initiated, peer counsellors can take over these activities in order to implement the philosophy of students speaking to students. Vocational education programs have begun to realize that teen to teen communication may be the most effective method to reach teenage audiences (Walton and Howard, 1980).

Many programs who have implemented our approach find a high number of female students volunteering. This is easy to understand since these young women are often more aware of their values of caring and expressing concern for others. We modify this imbalance by encouraging them to directly recruit or talk to male students. This has had dramatic effects in bringing in the young men.

At the information meeting we describe the training, potential uses, etcetera, and ask who would be interested. From questions they ask, we can infer student interests ("Can I take this in place of geometry? Will it be after school? Will there be course credit?"). At this meeting we usually ask a question of our own to make sure this is fitting in with student needs: "Would such a program be of value in your school?" The answer is always a resounding yes. Generally, there are more volunteers than can be trained at any one time, so we work out a schedule that puts students on a waiting list. For research oriented persons this waiting list can serve as a control group (we have done this). If parent permission is necessary, and we think it should be, partly to inform and educate parents through the permission letter itself, and in part to ensure their support, we distribute these to the students at the information meeting. We make sure the letter has enough detail in it, so that parents can make an informed decision. Anybody who works with students and sends things home to get signed knows how frustrating it can be trying to get them back, however, we have found the letter returned quickly, sometimes with handwritten post scripts praising the idea. Students also have commented on discussions they have with their parents about the program which have been stimulating and encouraging.

When the letter comes back we hold interviews with each student, during which time we ask them about themselves, their experiences in relating to others and we try to assess their learning style. This can be done with a specific instrument such as the Inventory developed by (Dunn and Dunn, 1978). We give them feedback about their style and we are primarily looking to see how interested they are in hearing about themselves. A decision to advance to training is made solely on the basis of two behavioural criteria: a) are they receptive to knowing about themselves, and b) do they have *severe* emotional problems which would make them unable to use the training or interfere with the training. If the answer is yes to this second question we will discuss possible referral with them to either school or community resources. We have underlined severe above because we often make a clinical judgment here, since students experiencing a variety of developmental problems can not only benefit from the training, but serve as excellent helpers for students with similar concerns. However, since the major goal of peer counselling training is to *increase* the number of students who have and *use* helping skills, the training should not be used as a substitute for group counselling or guidance courses.

Training Process. We divide students into separate training groups of six to eight, and the training consists of two phases. The first phase consists of 12 to 16 training sessions, one to two hours in duration, which we like to ideally schedule twice a week, so that initial training takes about six to eight weeks. The second phase consists of a series of supervised assignments resembling a practicum and weekly supervision meetings are held with students in groups of 10 to 12. Since we are strongly committed to a learning-based model of training, we have structured each training session with a systematic process to maximize student skill development. Each session begins with *continuity,* where old business is discussed, concerns expressed, opportunities for caring and sharing with others given, and homework is discussed. We then move to the *awareness* portion where a description or directions are given for today's session; the rationale and purpose are briefly stated; students make a self-calibration and/or declare their need concerning the topic and relate how it might fit them from their frame of reference. We next emphasize *know-how,* where we provide a demonstration, deliver a lecturette; use group techniques such as creative use, brainstorming, role play or modelling. Following this is the *assertiveness* section where students work in pairs, or trios doing simulations or other experiential activities. We then move to the *process* phase where observers give feedback; we inquire as to the quality of the experience; and work towards synthesis, integration and summarization. The session concludes with a *practice* phase where homework is assigned and then we start the cycle again with *continuity* at the next session. Homework is often an applied assignment focused on generalizing the learning from the session to the cultural world of the student. We closely monitor these steps and discover at many times a particular spot where we cannot move on to the next step because we haven't adequately covered a previous step. We rely continuously on feedback, observation and actual skill performance, and may recycle back to a particular step.

Training Content. We have identified twelve core topics which are essential to peer counselling and we have detailed the step-by-step procedures for the activities in our training manual (Carr and Saunders, 1979). The content we cover consists of: getting acquainted with strangers; attending skills; roadblocks to better communication; self-disclosure and expression of feelings; listening; empathy training; questioning; assertiveness or "I messages"; feedback skills; values clarification; decision-making; problem-solving; ethics; confidentiality and referral.

Once the core skills have been reasonably mastered we recommend that programs develop practicum topics from the experiences of the students trying to implement their new skills. We recognize they may feel awkward, mechanical or phoney so we accept this as part of the learning process and help them locate their feelings and thoughts. Handling silence; talking to students whose behaviours you don't dig; trying the skills in a group setting; and getting rebuffed are all examples of specific problems students bring up, which we turn into training sessions.

The final elements of the training takes place during supervision when special topics are introduced which relate to specific problems such as drugs, parents, career decisions, pregnancy. We may introduce speakers (who support process learning) to talk about certain areas or we may do refreshers in the core areas.

Our training model begins with a pre-determined structure and ends with a student determined structure. We retain the emphasis on process throughout, yet we are sensitive to the needs of the students so that neither the structure nor the process act as a barrier to truly understanding and fully relating to our student trainees. In other words, we remain student centered rather than strictly agenda centered.

Assignments as Peer Counsellors. When the approximately thirty hours training has been completed, the trainer(s) meet(s) with each student individually, and applying the guidelines from the activities on feedback, discuss with the student how they did on the training, what age level or kinds of problems they would like to deal with, type of setting or context and the readiness of the student to take on an assignment. Some students, through mutual decision, agree to take the training again, and are given assistant status. We have certificates that look like diplomas which we give to the students as a way of giving formal recognition. We have developed five major categories of assignments: group activities, outreach/alert, one-on-one, elementary focus, and external programs.

Group activities include team sports, clubs or other formal groups which exist in the school and in which the student is already a participant. The assignment is to look for ways to use the skills in these groups (a fellow team member is looking discouraged after having struck out for the fourth time; a member loses a chess match; or just normal conversations about concerns of youth). Students may also get involved in informal or "rap" groups or participate in special groups structured to deal with certain problems such as divorce, loss, drugs, pregnancy, etc.

The outreach/alert assignments support the student in tuning in to their existing network or paying attention to clues which may indicate another student is having difficulty (a student slams a locker, a student is crying in the washroom, a student sits alone and dejected on the playing field, etc.) These informal and spontaneous contacts are the core of peer counselling. The peer counsellors usually experience immediate acceptance from the troubled student, once that person sees that the peer offers genuine listening and caring. Since this helping is dependent on the students becoming involved in the many social networks in the school, we anticipated during our early training experiences, that the peer counsellors would become an elite clique of their own. Yet this has not happened. Though they remain friendly towards each other, they do not socialize together, and retain themselves in their primary social networks. In a sense this reaffirms the need for and success of a broad selection process.

One-on-one assignments are usually based on a referral process where potential "clients" may be referred to the trainer (coordinator) by parents, counsellors or teachers. The coordinator reviews the referral with the adult to determine its appropriateness and specificity. An assigned peer counsellor then talks to the referring adult and the adult introduces the student to the peer counsellor. We encourage the peer counsellor to have their first meeting with the student over lunch because food is friendly, there is a specific time limit, and if it doesn't work out, they can always eat. Once the student and the peer counsellor begin meeting, progress is reviewed, and modifications are made if the peer counsellor is in over his/her head.

Sometimes these referrals are just attempts to help students get to know older students and feel less lost or alone or enhance their self-esteem ("Wow, a twelfth grader is spending time with me!"). Other referrals can be for specific problems, including academic difficulties, and a peer counsellor may engage in tutoring. We have found our tutors to be keenly aware of the feelings a low achieving student expresses about being able to do certain academic work, and the peer counsellor/tutor often can give encouragement, support and teaching in a more effective way than a tutor who doesn't pay attention to the feelings of inadequacy of the tutee.

Some peer counsellors want to work with elementary age children, so arrangements are made with neighbouring schools to use these students to lead groups, talk with individuals, help with orientations or work on the playground. Other students may become associated with another external program such as a recreation centre or peer counsellor training in another school or community context. We have plans to use many of the trained peer counsellors as summer street workers, aiding the groups of kids who gather at various locations on a regular basis throughout the city during the lengthy summer vacations.

Regardless of assignment, formal or informal, on or off-campus, the students meet weekly in a group to discuss their progress with their supervisor. While the names of "clients" are not discussed, the kinds of concerns brought up or discussed are, with an emphasis on the peer counsellor's perception of how they handled the situation, and the skills they used. Sometimes it is clear that certain skills may need refreshing, so a workshop is scheduled; other times it is clear that there is a commonality to the problems "clients" are bringing up and that a possible system-oriented intervention can be developed and presented to change makers. These weekly meetings enable the peer counsellors to experience support and autonomy while at the same time see that they are not alone in trying to help other students work towards effective solutions to frustrating problems.

The Peer Counselling Project. In 1978 after conducting numerous isolated training and information workshops on peer counselling across North America, we decided (with the financial help of the Educational Research Institute of British Columbia) to establish a centre at the University of Victoria which would facilitate the development and growth of peer counselling. The demand for our materials and services has been gratifying and valued. We rarely get involved in training peer counsellors directly. Instead, we have shifted to training trainers, providing both credit and non-credit university courses in peer counselling, consulting with existing programs and conducting research in peer counselling. We have extended our model to a variety of populations including the elderly, young children, pregnant teenagers, community colleges, hospitals and correction facilities. However, we continue to maintain relationships with programs throughout North America, and maintain up-to-date mailing lists identifying schools or agencies using our materials around the country. Since we began our Project, we have seen a dramatic increase in the number of programs interested in adopting peer counselling approaches. We can understand this expansion because more and more people who work in the helping professions are asking themselves how they can involve clients as resources, and in what ways can they help clients help themselves.

In summary, we support efforts of counsellors to discover additional ways to involve students as resources in the counselling process. As long as students are forced to play a passive role, areas like career guidance will suffer. The counsellor as expert may encourage student passivity, and even advances in computer technology may only give students the illusion of control. We also support a systems-oriented approach which works to understand and accept negative or problematic elements of culture as challenges to be used rather than eliminated. Thirdly, we support a strong focus on developmental psychology in order to recognize superficial expressions of concern, not to discard them, but to use as an avenue for deeper explorations. Adolescents are facile at "smokescreens" to cover up fears and anxieties. Their search for meaning during the early years may look like conflicts over lipstick and tight clothing, but it is symbolic of concern for self. Their concerns about dating in middle adolescence may look like sexual activity, but it is a search for interpersonal competence. And finally in later adolescence, conflicts with adults over values and ideas are strong attempts to find meaning in their lives.

We conclude with an exercise we often use for helping adults identify their own peer-related decision-making in order to test out the power of friendship relations throughout the life cycle.

1. How many of you have been thinking about your own career during the last month? That is, how many have had thoughts or concerns about your career choice or progress or are thinking about changing jobs, retiring, advancing, etc.?
2. Formulate these thoughts, feelings into a statement such as, "During the last month, I've been seriously considering . . .". (Write it down, briefly.)
3. Now think about how the person next to you might be able to help you with this consideration. What would be, in your view, the most important thing they could do to help you with what you've been thinking about?

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Peer Intervention Technology

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Introduction

During the last two decades there have been numerous reports regarding the effectiveness of using non-professionals to perform counselling, teaching, and guidance tasks which are usually considered the realm of professional workers. The significant achievements of programs using peer intervention techniques merit a critical review and general evaluation. As much of the published documentation concerns the use of students in these tasks, the available reports are most easily organized around research with students. However, this review attempts to survey reports concerning as wide a range of target populations and problems for peer intervention as possible.

Perhaps one reason why new techniques for dealing with old problems have often originated in the educational system is that more testing is typically conducted within that system than is usual elsewhere. As a result, recognition of the limited successes of professionally-centered methods have been more numerous in this field. It is also possible that more types of problems are present in the schools than in other systems. Adolescents are confronted with adjustment problems concomitant upon the high rates of physiological changes during their school years, exacerbating the symptoms of normal problems to which human beings are heir. Mosher and Sprinthall (1970), remarking upon the deficiencies of the educational system relative to personal growth, note that "in general . . . schools . . . have tended to define their roles as the transmitter of academic ideas and skills" (p 913). In order to fulfill this goal, the response among educational institutions during the 1950's was to assign students to homogeneous groups on the basis of psychological testing and evaluation. The fact that screening procedures so regularly result in the formation of some groups which can, and others which can not be taught well has brought recognition that there must exist factors other than differential aptitude and achievement which are prerequisite to good academic performance. The notion that these prerequisites might be taught is the thesis of Mosher and Sprinthall's (1970) work. They point out that, stripped of their myths, psychological services within the school really perform two functions:

1. The adjustment of students to the school, with the goal of the adjustment being satisfactory academic achievement and conformity to school codes for acceptable behaviour; and
2. Determining with the student what courses he/she is to take or what college he/she will attend.

They criticize this view of the role of the school counsellor as being excessively restrictive, providing no genuinely significant psychological services for a majority of the students in secondary schools. Students face a complex, technological society where the extended family unit has been eliminated through the need for geographic mobility. " . . . the rate of societal change, materialism, the exposure of adult hypocrisy, the rise of a separate youth culture, the decline of 'traditional' values and the growth of emergent values, affluence and poverty, the failure to value 'parenting', the bomb" (p 911) are all suggested as causes of the general failure of the schools of the 1960's to promote positive and healthy development during adolescence. They are also reasons why " . . . youth experience and are more deeply affected by (the ills of society) because they live, psychologically, in a more exposed and vulnerable position" (p 912).

During the decade following Mosher and Sprinthall's (1970) call for increased involvement in the psychological growth of students among professional school counsellors, it has become apparent that counsellors' perceptions of their role have become much less restricted. Defining "intentionality" as the capacity to anticipate alternative experiences, choose among them, and attain their desired goals, Ivey and Alschuler (1973) suggest that the metagoal of psychological education (the domain of the school counsellor) is to increase intentionality, and the strategy to teach intentionality as effectively and inclusively as possible. Toward this sort of goal structure (and in the face of decreasing enrollment, budgetary limitations, and general economic decline), the 1970's has brought a period of advent of peer intervention techniques. It will be shown that for certain goals, this is a readvent rather than a *de novo* appearance of untried techniques, and that these methods have been instituted both among students, between students and non-students, and among other developing groups.

The 1970's have also brought a proliferation of articles in a number of areas comparing the use of non-professionals with professional intervention. This area is particularly surprising in light of the almost complete absence of reports of failures of non-professionals to perform as well as professionals. Speaking of the use of students to teach and tutor, Thelen (1969) states "I can think of no other innovation which has been so consistently perceived as successful” (p 230). This statement applies to other uses of non-professionals in professional roles as well. For example, the most recent available review of articles comparing peers and professionals in counselling (Durlach, 1979) reports that among 42 published studies, only one reported case of professionals exceeding the effect of non-professional intervention exists. Thirty studies reported no difference, while 11 supported the notion of superior effectiveness of paraprofessional intervention. Such general agreement among the authors in any field presents a number of sensitive problems. One doesn't want to seem comparable to chicken little, shouting “The sky is falling” when everybody knows that it is not. Yet, in more experimentally-oriented areas where there is general agreement as to the effectiveness of a procedure (For example, the literature concerning the effect of early experience on later development) there is always some evidence of failure to obtain an expected effect (Denenberg, 1977). One grows to expect non-unanimity among investigators. Failure to find it in any area leads one to consider alternative explanations as to why. It is a goal of this paper to consider less obvious possible reasons for the unique agreement among workers investigating peer intervention techniques.

A possible effect of the institution of varied peer intervention programs has been the demystification of the notion of “helping”. Ivey and Alschuler (1973) note that helping can not and should not be licensed; rather, it should be taught to the widest possible audience. Toward this goal, they assert that the system of education needs as much guidance as do individuals. Counsellors have too long kept their skills to themselves, through a “mystifying process we term ‘professionalism’ ” (p 596), and have made the error of treating victims of inhumane institutions instead of organizing to restructure learning and schools so there will be more healthy human beings and fewer casualties.

Another effect has been the heterogenisation of the classroom in numerous educational systems. For example, Thelen (1969) notes that in Bethpage, Long Island, all the students in the John H. West elementary school have been placed in classes which have a two- or three- year age span. Classes, then, might have 6-, 7-, 8-year olds, 7-, 8-, 9-year olds, or 9-, 10-, 11-year olds, etc. Thus, a student may be among the youngest or the oldest students in a class, depending on his/her needs. Moreover, closely-spaced siblings may be in the same class. A benefit of this structured heterogeneity is that there are always endogenous tutors available for those who need it. This example is an extreme one, involving continual disregard of grade status. Other applications involve importing college tutors to high school, high school tutors to junior high or grade schools, or grade school “elders” to "junior" classes at various intervals for various periods of time. Professionals involved in these programs consistently report them to be successful.

A rather unexpected benefit of the increased use of peer intervention programs has been gains among the students chosen to intervene. Increased self-esteem is most commonly noted (Gruver, 1971) but increases in academic skills among tutors has been reported as well (Gardner, 1978). Perhaps the idea of helping a junior in his/her development is a more effective impetus to review old skills and develop new ones among otherwise less motivated senior students. Student tutors are reported to be innovative, energetic, and understanding in their efforts to assist those in their tutilege (Gardner, 1978).

To summarize, recent methodological innovations in systems whose goal it is to foster and further development have produced reports of the effective use of members from a developing population to help other members of that population through a process called "peer assistance" or the "use of paraprofessionals". It is the purpose of this article to review these reports, and to comment on similar efforts in three primary areas:

1. peer tutoring, for academic goals;
2. peer guidance, for specific problems of more social nature; and,
3. peer counselling, for emotional, social, or personal problems.

Within this domain, methodological problems and limitations present in the literature will be discussed. Alternative hypotheses will be offered to account for the apparent success of peer intervention techniques. What seems to work, and whether existing data in fact favour the notion that it works will be discussed. Finally, directions for future research and guidelines for program institution will be considered.

Peer Tutoring

The practice of students helping one another is hardly novel. First, friends have always done their homework together outside of class. In addition, the "little red school house" accommodated students of all ages in a single room. The teacher often relied heavily on students learning from each other, if only by osmosis through their overhearing one another's recitations. For example, under the Lancastrian Monitorial System of the 1820's, the teacher primarily instructed the older students, and had them drill the younger students in turn. When teachers today assign a group of students a project, it is partly in the reasonable expectation that they will teach, and learn from one another. The seminar courses so often encountered in post-secondary education are based on the same principle. However, following the homogenization of classes in public schools during the 1950's, these methods became less easily applied. Recently (Thelen, 1969; Gardner, 1978) the use of peer tutoring techniques has re-appeared.

As has been noted, it was during the advent of the use of standardized psychological tests to homogenize classes that homogeneous groups of underachievers appeared in force. A fairly recent discovery is that among certain of these groups, the competitive atmosphere of the pre-tested and matched classroom works against individual achievement. For example, Spilerman (1971) notes that lower class and minority children and adolescents are more peer oriented than are their middle class counterparts. Therefore, he concludes that the competitive nature of the classroom may conflict with the cooperative nature of their peer culture. Slogget (1971) found that among a group of native Hawaiian students, peer orientation was so strong that they refused to excel for fear of making their peers look bad. With reference to these findings, Slavin (1977) comments that other minority groups may in fact exhibit the same dynamics. The explanatory power of this thesis proved to be strong in his study, which found that student team learning techniques were especially effective among minority group members, narrowing the achievement gap between the races. As it was applied in 7th grade classes in Baltimore, Md., the most important feature of this technique was teams of four to five students of different past achievement. Each team was made to represent as closely as possible a cross-section of the class with respect to sex, race, and academic achievement. Worksheets to be studied in pairs or as a group through peer interaction were given every team. Repeated testing demonstrated that, following a statistical correction for previous achievement (analysis of co-variance), the team method appeared to increase achievement dramatically among blacks, but only minimally among whites.

Students differing in their need for approval may also respond differentially to competitive incentives. Coady and Brown (1978) investigated performance on a number-crossing task (removing the 3's and 7's from a random series of printed numbers) among 8 to 10-year old Ottawa school children selected for high or low need for approval. They report that the performance on this task covaried with motivation. Students were tested for need for approval using the Children's Social Desirability Questionnaire (Crandall, Crandall, and Katkovsky, 1965), and groups of high and low need for approval scoring students were formed. Motivation for the task was manipulated through the use of three different instructions:

1. (control): "cross out the 3's and 7's on this sheet";
2. (competitive): instructions no. 1, plus "you may win a prize for doing well"; and

3. (normative): instructions no. 1, plus "most children your age do very well at this."

They found that either experimental incentive fostered better performance than the control incentive. Investigating the incentive X group interaction, they found that it resulted from those students in the high need for approval group performing better with the normative incentive, while those in the low need for approval group performed better when given the competitive incentive. Coady and Brown (1978) remark that approval seeking children do not seek approval *per se,* but rather avoid disapproval through modeling normative behaviour. They avoid self-initiated activities, and are less persistent when engaged in achievement activities. It appears from these findings that need for approval has pervasive motivational components which interact with the drive-increasing capacity of various incentives. The competitive nature of homogeneous class structure works against achievement among students with a high need for peer approval. As previously mentioned, need for approval is especially high among minority group members.

It may be true that a minority group can be functionally defined in terms of the recognition or the general perception of minority status among its members. If this is an acceptable notion, then any socially identifiable subset of humanity may be a functional minority group. Students, through being placed in a society of their own (the school system), or any other similar group placed in a separate social system (e.g., the unemployed, the impoverished, prisoners, welfare recipients) may be motivated to avoid high achievement in the presence of their peers, due to a high need for their approval. In this event, contact with members of their group who perform well could change their patterns of achievement.

Vriend (1969) provides some support for this notion in her report concerning a peer tutoring project among lower quartile socioeconomic status eleventh grade students in Detroit. Students were divided into high- and low-performance groups (HP and LP) on the joint bases of their grade point average, scores on standardized achievement tests, and teacher recommendations. The six students in the HP group were trained as peer leaders and assigned to one of two groups:

1. A control group with 9 LP students. No further extraordinary treatments were provided for this group; and
2. A demonstration group with 9 LP students.

The latter group was further subdivided into three groups of 3 LP students and one HP student. Every demonstration group was given a session with the school counsellor once per week, 3 unguided group study sessions per week, and one session of guidance activity per week for two semesters. Following this period, alternate forms of the pre-test were administered, and grade point average for the year determined. Following a statistical correction for pre-existing group differences (analysis of covariance), the demonstration group performed significantly better than the control group on the SCAT, all five subscales of the STEP, and grade point average. Further, aspirations, attendance, and punctuality were higher among the demonstration group.

In evaluating peer support effects as demonstrated in this study, it is important to note that the comparisons made were between a group receiving no treatment and a group receiving both professional and peer assistance. As a confounding of treatments is evident in the design, no independent test of peer intervention effects is provided. In addition, the applicability of the analysis of covariance to situations where test-retest reliability is imperfect, or where pre-existing group differences are large is questionable. However, the results are indicative of possible effectiveness of peer support among high school students rendered a minority by race, age, and socioeconomic status.

The use of peer tutors is by no means confined to the high schools. Jacks and Keller (1978) report their success in establishing "multiple support systems" through the training and development of a "network of helpers" to assist them in approaching adolescents in a special school for the learning disabled. They present their program as an alternative to programs concentrating on remediation which are more commonly available; and they assert that the target population for these programs may simply require more options than most. Although no formal measures of success were taken, the global staff and student impression was that the peer tutoring helped.

Gardner (1978) instituted a peer tutoring program among 1st to 4th grade students in Detroit public schools. Interestingly enough, both tutors (3rd and 4th graders) and students (1st and 2nd graders) were selected on the basis of their being at least one standard deviation below the mean in both cognitive abilities and reading skills. Tutors were trained for 11 weeks (4 days a week, 40 minutes per day) and were provided with tutoring materials. Further, group "get-together" sessions (discussions, field trips, and an awards assembly for participants) were built into the program. Both tutors and students are reported to have gained more, significantly more, than in previous years in both reading achievement and cognitive abilities. The authors discuss this finding as a result of the experience in the tutoring project. However, the exact results of the tests were not made known. The lack of a control separate from the subjects' previous achievement test scores flaws this design, leaving a number of confounding variables as possible explanations for the gain. In addition, the absence of any follow up testing allows one to question the permanence of the peer intervention effect. These drawbacks are recognized by the author, although he gives no reason for allowing them to persist. However, maturational confounding is made less tenable as an alternative hypothesis through the use of a wide age span of subjects. This interesting report of positive effects of tutoring on the tutor is not without replication, as will be reviewed subsequently.

Peer Guidance

There are relatively few studies relating to peer guidance techniques in one specific area. Usually, peer guidance techniques are applied to a fairly wide range of problem areas at once. The few studies relating to single guidance topics are important, therefore these will be reviewed first. There will be a review of the more numerous general uses of peer guidance to follow.

Academic Skills: Only two laboratories work with relatively "pure" academic skills peer guidance. One of these (the lab of W.F. Brown in Texas) has published a report which is possibly the most frequently cited article comparing the effectiveness of peer and professional guidance counsellors (Zunker and Brown, 1966). As this study supports the notion that peer guidance is more effective than professional guidance, and as there are serious interpretational problems involved with it, it will be examined in detail.

Zunker and Brown (1966) selected two male and two female professional counsellors under the restriction that they were certified in Texas, at least ten years older than the average freshman at Southwest Texas University, presently employed as guidance counsellors having a minimum of 5 years experience and at least an M.A. degree. They were also to have been recommended by two professors at the University. In addition four male and four female upperclassmen at the University were selected. All those selected were given 50 hours of training in the use of an academic adjustment and guidance program previously instituted at the institution (Brown, 1965). Their clients represented all but eleven of the incoming freshman class: 160 males and 160 females, and each sex group was split into two groups and matched with regard to age, scholastic ability, study orientation, and high school quartile rank. Thus, two groups of 80 students of each sex were formed, and then matched. Counsellors were assigned only to like-sex clients. Counselling consisted of survival orientation, test interpretation, study skills guidance, and a study skills survey. Following a semester of guidance, Brown's effective study skills test was administered, grade point averages determined, and a questionnaire regarding effectiveness of the program evaluated. The results were taken to indicate that professionals and upperclassmen did not differ in their ability to communicate study skills as measured by Brown's test, that clients believed that the students gave the most useful information, that female students with student counsellors improved their study skills more than females with professional counsellors, and that on the whole, student counselled freshmen retained more information other than study skills than professionally counselled freshmen.

Taken at face value, this study represents strong support for the use of student counsellors. Even considering the fact that professional guidance counsellors dealt with twice the case load as the selected students, and that age and social differences between long-standing professional counsellors and students would render the professionals less familiar than students with three of the four guidance activities (all but test interpretation) these data seem to speak against the necessity of prolonged training as a prerequisite to effective guidance.

However, there are several more serious problems in Zunker and Brown's report, consideration of which is essential to a rigorous understanding of the outcomes. Not the least of these is that matching of groups is no replacement for random sampling, which was clearly not approached in this study. Unless one confines one's conclusions to statements regarding the entering freshmen class at Southwest Texas University in 1963/4, one is likely to suffer from a serious positive biasing present in this study. Typically, authors who interpret these findings do not restrict their conclusions in this fashion (e.g., Durlach, 1979).

Perhaps more important is the fact that a close inspection of the structure of the academic adjustment guidance program used by Zunker and Brown is necessary to an objective interpretation of their results. This program is described in detail in Brown (1965), and (prior to Zunker and Brown's experiment) included student guidance faculty advice, and professional personnel worker's guidance (all of which are available at any university). Students were primarily responsible for handling personal-social orientation and academic adjustment activities. The only aspect of this program which was altered in Zunker and Brown (1966) was the student guidance: for half of the freshmen, professional counsellors performed this function. Thus, the treatments for the two groups in Zunker and Brown (1966) were not simply differentiated as professional *vs* non-professional help. Rather, the comparison was between a student plus faculty plus professional helping team *vs* a professional plus faculty plus professional team. It is not surprising that the omission of student input to the latter team limited its effectiveness in dealing with personal-social orientation, nor is it indicative that student guidance is superior to professional guidance. It is perhaps unfortunate and potentially misleading that this experiment (Zunker and Brown, 1966) and the details of the method used (Brown, 1965) were published separately, for a knowledge of both is essential to an accurate interpretation.

There is stronger evidence that student guidance is effective for academic purposes. McElroy (1976), working with entering freshmen at Carson-Newman College in Tennessee to facilitate their personal, social, and academic adjustment to college life, implemented a peer guidance program. Two hundred twenty-four freshmen were met on their arrival at college by 24 upper class students trained as counsellors. They were introduced to a program designed to facilitate their transition to the college community. Small groups were formed, and these met weekly throughout the fall. The counselled group achieved significantly better grades and suffered significantly lower attrition than did the non-counselled group. Although there was no attempt to compare professionals with student counsellors in this study, it is clear that the normal guidance staff could not have dealt with a case load of 224 freshmen every week. Given some training, the 24 student counsellors were able to provide this service, to the apparent benefit of the freshmen.

Career Skills Guidance: Few reports of guidance programs using peer intervention techniques for the fostering of career skills are available in the literature. However, this is not because there is no need for such programs. Williams (1975) devised a need assessment questionnaire in the area of career advising and development, seeking input from 204 randomly selected 7th and 8th graders in four predominantly black schools in Washington, D.C. Among this sample, only 5 of 10 possible career clusters evoked interest. This finding is partly traceable to the fact that race and sex discrimination in job opportunity continue to hinder minorities in North America; and partly due to the importance of parental input to students in general. Planned intervention with respect to potential career variety could be important in expanding the career goals of students, especially among racial minorities and the poor. Sampled students valued the caring, companionship, understanding, and educating qualities of their peers, and expressed an almost universal interest in peer advising. Most felt that peers could be trained as guidance aids, and about half of them expressed an interest in being so trained. If the responses of socioeconomically oppressed minority children were atypical, they would be most likely to reflect a reduced optimism about a new program's potential for assisting them in achieving a successful career. However, on the whole these students were optimistic about the suggested program, and interested enough that half of them wanted to participate. Thus, the desire for peer guidance programs seems widespread among secondary school students. Judging from this report, the implementation of such programs lags behind the interest of the client pool.

In New York City, peer intervention has been included in a career guidance project developed for female black teenagers (Louis *et al,* 1976). Peer intervention took two forms in this report: the use of peer groups in career guidance discussions; and the use of peer aides participating in the discussion. The peer group complex was a communications network among black female teenagers which was aided by staff supports, including peer aides (professional black women whose backgrounds were similar to those in the group). Groups of about 10 participants and 1 aide (51 participants and 5 aides in all) met two hours per week. Participants included those who were still in school, and those who were out of school. One of the most clearly identifiable benefits of the peer mechanism in these groups resulted from the interaction of people from these two populations. Participants who were still in school tended to view job problems, education, careers, and related matters in ways which were fundamentally different from those who were out of school. A tendency to doubt that one might eventually "make it" was more characteristic of persons who were out of school, as opposed to the hopeful attitudes common among those who were still in school. This doubt was especially common among those who had never looked for work. In addition, it was easier to get those who were still in school to adopt more severe educational standards for themselves.

The authors recognize that it is impossible to evaluate the peer intervention effect in isolation from other effects on the basis of their data, as the effect of peer aides and staff support is hopelessly confounded with it. Indeed, they admit that the reported success of their project (measured by comparison with a matched control group) was a direct consequence of its ability to locate jobs for the participants through the efforts of the project staff. However, the heterogeneity of the groups was recognized as a beneficial factor, and the authors state that the peer process is a valuable tool. The participants report that they felt good about the program.

Another project incorporating peer intervention for career guidance integrated career related activities into the secondary school curriculum of New Hampshire schools (New Hampshire State Department of Education, Concord, New Hampshire, 1974). This project utilized multiple programmed guides, professional guidance personnel, and groups of students to provide more accountability for students' career needs, to enchance school curricula, and to develop student self-awareness regarding careers. Many learning activities are incorporated into the program, with the rationale and objectives of each clearly defined. This program has been widely instituted in New Hampshire, but an objective evaluation of its effects has not been made.

Emotional Guidance: It is in the area of emotional guidance (most commonly referred to as "counselling") that the most careful comparisons of peer and professional intervention have been made. This may follow from the fact that it is in the area where the most severe mistakes are feared (Allen, 1973). A recent review of this comparative literature (Durlach, 1979) points out that the strongest support for paraprofessionals has come from studies directed at the modification of specific target problems. In addition, this support is consistent, regardless of the research sophistication of the study in question. On the basis of a review of 42 studies, Durlach (1979) states that on the whole, the experimental quality in this area is as good or better than other clinical areas.

Upon reviewing several studies not covered by Durlach's review, much of what he says may be confirmed. However, it must be mentioned that the quality of control in the clinical literature is generally quite low. Thus, although the logic behind the use of peer counsellors appears sound, the adequacy of the tests of the effectiveness of peer intervention appears less so. A typical rationale for the use of peer counselling is summarized by Schweisheimer and Walberg (1976):

1. Peers model one another's behaviour;
2. Peers may have greater capacity for empathy for one another;
3. Peer counsellors can bridge the gap between professional helping agents and their target populations by facilitating communications and providing services without the stigma of professionalism;
4. Using peer techniques, professional personnel can extend the scope of their influence at relatively low cost; and,
5. The personal growth of both the counsellors and the clients may be enhanced.

It may be noted that most of these items have parallels in the peer guidance and peer tutoring literature. Using this rationale, Schweisheimer and Walberg (1976) instituted a global program of peer counselling among high school students in Illinois. Following 30 hours of training over a 10 week period plus a weekend workshop, 16 high school juniors (chosen on the basis of peer nomination in terms of their empathy) counselled 53 freshmen and sophomore clients (69 controls) chosen on the basis of school records and/or professional counsellor indication as being in danger of dropping out. Counselling was global, as was testing (involving the use of 16 standardized scales), which followed 20 one hour sessions over a 10 week period. Multivariate analysis of variance revealed a significant groups effect, and subsequent multiple univariate analyses indicated that measures of attendance and decisiveness were important in producing the multivariate effect. These results are not very surprising, nor was the program a marked success, by the authors' own admission. As Durlach has noted (1979) it is with specific treatment programs (as opposed to global) that peer intervention has shown its clearest effects. Evidently, one cannot train a functional general counsellor in a very short period of time.

By way of contrast with the previous study, Wasserman, McCarthy, and Ferree (1975) report on the use of student counsellors in a structured program which has shown clear evidence of success. The "companion program", a student-operated peer counselling service, is based on the view that trained peers working in a paraprofessional helping capacity can be effective therapeutic agents. Students are trained in social learning theory, and in the use of a model labelled the BEST (Behavioral, experiential, simulation-training), the focus of which is upon learning specific skills. The eight training sessions are spaced over two-three weeks, and each is three hours long. Veterans of the program attend these sessions, taking an active role in the teaching. Thus, peer tutoring is used to teach peer counselling. Initially, the history and rationale of the program are discussed, along with the notions of ethics and confidentiality. The rest of the training program concerns the mechanics of counselling: setting up the initial contact, behavioral rehearsal, giving feedback, problem solving, goal structuring, and the termination process. During the counselling process, specific client problems are defined in behavioral terms, and solutions are suggested and rehearsed. Often the counsellor and client reverse roles in order to expand the client's view of his/her problem. The counsellor may then model appropriate behaviour, practising scenes and situations that are relevant and appropriate to the client's environment. The reported success of this method is good, but formal tests are lacking. There are reports of the successful use of careful selection of student counsellors as an alternative to training or provision of structured materials (e.g. Fine *et al.*, 1977), but the interpretation of the successes inferred from questionnaire data is unclear. By and large, specific training and target problems result in the clearest evidence using peer counselling (Durlach, 1979).

Firm evidence as to the mechanism of the effect of specific training is available in the work of Zweibelman and Hinrichsen (1977), who investigated the effect of training concerning alternative approaches to problems of human sexuality on the responses of experienced peer counsellors at the University of Miami. Prior to training, the records of the counselling center indicated that human sexuality problems (pregnancy, birth control, and abortion) were processed primarily through referral to professional help. In fact, 63.3% of counsellor responses to human sexuality problems were classified as "referral only" as opposed to 3.7% for other personal problems.

In addition, the relative frequency with which peer counsellors acted as the sole helper was only 11.1% for human sexuality, in contrast to 65.2% for other problems. The proportion of cases in which the peer counsellor gave both extensive counselling plus a referral was lower for human sexuality (25.4%) than for other personal problems (31%, $p < .001$) prior to training.

Following specific training concerning problems of human sexuality, peer counsellors continued to function as referral agents, as one would hope nonprofessionals would do concerning this problem area. However, there were significant increases in the other response modes. The most dramatic impact of the training program was on the mode of peer counsellor response to birth control and abortion cases. There were substantial decreases in the proportion of cases handled essentially through "referral only", and equally impressive increases in the proportion of cases involving extensive peer counselling plus at least one referral. The relatively small increase in the proportion of "counselling only" responses suggests that peer counsellors did not overestimate their own abilities subsequent to training. Finally, there was a sharp decline in the number of "other problems" which were processed by the counsellor alone. Evidently, training in a specific area sensitized peer counsellors to their limitations in other areas at the same time as it relieved unnecessary limitations on their responses to problems in that specific area. In short, peer counsellors learn well, especially when the training is specific in scope.

The work of Ruhl (1977) supports the notion that specific training of peer counsellors is effective, and extends it into a crisis intervention framework regarding problems of drug usage. Thus, effective counselling may be trained, and it may be the case that effective counsellors must be trained. If this is the case, it is not surprising that extensive education seems unnecessary in the peer counselling literature: such programs are most effective when they are narrow in scope. Thus, training may be limited to one or a few specific problem areas. In this way, the educational process is shortened among helpers, but at the price of a limited effectiveness.

Another program in which rigorous training has been directly linked with the success of the effort is one described by Hamburg and Varenhorst (1972). The authors report on the establishment of a community mental health project in the high schools of Palo Alto, California. Their list of potential counselling areas was long and broad in scope, aiming both at chronic problems and at normal adolescents who were troubled due to transient situational stress. The project was carried out in close collaboration with a team of mental health professionals who took part in training the counsellors and with a planning committee comprised of parents, teachers, students, and school counsellors. The breadth of planning input was designed to insure acceptance by the school hierarchy and the community at large. Students were recruited from junior and senior high schools in the district, and preliminary meetings with small groups of potential volunteers were arranged. Then an orientation meeting was held after school in March, 1971. No one who volunteered for the program was refused, but all who attended this and every subsequent meeting had to arrange for their own transportation. The training program was set up in such a way that hurdles and obstacles weeded out students of lesser commitment. Thus, the program was based on the principle of self-selection and volunteer participation. No screening took place separate from the training regimen, but the stringent requirements of the program and the emphasis on a high degree of responsibility acted to eliminate students who might otherwise be a potential problem.

During the first part of their training, students used the Life Career Game (Varenhorst, 1968) to learn the consequences of life's decisions, and were trained in small group dynamics, interpersonal relations, and peer counselling. Training was in the afternoon after school every day, or in the evenings Monday through Wednesday. Missed meetings were to be made up. Halfway through, training groups were re-assigned. Despite the delay of dealing with humans, the switching of groups, and the other hurdles, 155 of the 162 students who continued after exposure to the life career game completed the program. The training procedure itself clearly represented a significant growth experience for the counsellors. Trainees who initially needed help apparently got it through the training procedure, and all were prepared to help other troubled youths. Informal evaluations by students and supervisors were positive and enthusiastic. Anecdotal reports of "problem" students becoming effective peer helpers were numerous.

Evidently the reported success of the Palo Alto training program stems from two major sources. First, the training program itself weeded out the bad apples while providing a sense of cohesiveness, providing skills and a method of counselling; and second, the inclusion of parents, teachers, school counsellors and professional clinicians in the planning stages resulted in the faculty, staff, and students routinely including the team in an overall institutional effort (the importance of this latter point is mentioned by Gruver, 1971, and Conroy, 1978). Thus, the novelty stage of the program was quickly passed, and the wide array of services a student team can perform was apparently used to optimal advantage.

However, the methods used in evaluating the program may be criticized on the basis of the work of Johnson (1977). Johnson was attempting to evaluate these models of student counselling of first year college students at Michigan State University. All volunteers received 18 hours of orientation and either no further training, or 20 hours of training in Behaviour Modification or Systematic approaches. Using questionnaires relating to self-perceptions, attitudes toward education, and counselling relationships, she found no difference between the various models, all of which exceeded no training or no counselling. A key finding of this paper is that clients and counsellors who liked each other, and who felt that they had a lot in common with each other tended to rate counselling as successful. Thus, there is a serious potential perceptual bias toward favourable impressions from people who could relate to their contacts in the program as measured by questionnaires, and toward unfavorable reports from those who could not. This notion receives indirect support from the survey of peer and professional counsellors and their clients reported by Persons (1976), who has noted that same-sexed counsellor/client dyads resulted in more generally favourable reports.

It is apparent that both careful selection and specific training of counsellors have been reported to result in successful peer counselling programs. R. Carkhuff's (1973, 1970) research on training of counsellors, and especially his theoretical comments on the helping process may explain the effectiveness of both procedures. From his point of view, there are three principles, and three phases, to helping. These principles are:

1. The helper being able to do things the helpee cannot do;
2. Helping begins with the helpee's frame of reference; and,
3. A helping program exists to move from the helpee's frame of reference to the helper's level of functioning.

The phases are:

1. Emphasizing self-exploratory behaviour in relation to the helpee's areas of concern;
2. Emphasizing helpee self-understanding behaviours in relation to the areas of his/her concern; and,
3. Emphasizing helpee action behaviour in relation to the areas of his/her concern.

In addition, Carkhuff enumerates sets of helper behaviours which must be mastered, and levels of helpee responsive behaviours which are of evaluative help. From these lists, it is evident that there exists a complex set of interactions which influence the effectiveness of any helping program. Selecting potential counsellors for both skills in a specific area, and in dealing with people (so-called "empathy") would be one way to insure the development of an effective program. In contrast to selection, careful training could achieve the same goals. According to Carkhuff's theoretical framework (1973), either would work, but favourable results of less than extremely restrictive selection would be more fortuitous.

It has been asserted that the process of students helping other students (or, problem-ridden people helping other people with like problems) is not new. What has been reviewed here is the appearance of some new helping roles, the reappearance of some old ones, and some novel suggestions for implementation of peer intervention programs. However, there is a new effect which is reported in many of the studies in this area (e.g., Hamburg and Varenhorst, 1972). This is the appearance of reports of positive effects of peer intervention on the *intervenors* (the counsellors, tutors, and the like). Some more recent efforts have aimed at measuring these effects, which may be the opposite of the intent of other efforts.

Gruver (1971) in a review of the use of college students as therapeutic agents, notes that the available literature contains much evidence of significant positive changes in self-acceptance and moral judgment among counsellors as opposed to controls. Self-confidence and understanding have also been reported to increase. Gruver tentatively traces this phenomenon to an enlarged and more flexible system of personality constructs, a clarification of self-concepts and identities persuant to training, and to possible emotional catharsis and knowledge that one can influence the lives of others which follows the process of helping.

In addition, students with academic problems have been shown to improve through acting as a tutor. Gardner (1978) in a study previously reviewed, reports just such a finding. Apparently, learning may be facilitated by allowing one learner to teach another. It is possible that motivational increments attributable to the privilege of teaching account for this finding.

Whatever the mechanism of the reported gains by the helpers, it appears to be dependent on the helping interaction, rather than on training in preparation for it. For example, Tuff (1977) reports that participation in a counselling skills training group produced more positive effects than either group therapy or no treatment, but that these effects were confined to increments in scores on GAZDA's Global Scale of Counselling Skills, and were not reflected in scores on the Multiple Affect Adjective Check List. In contrast, Wendel (1976) shows evidence for increases in self-concept as a learner among 5th graders, resulting from counselling of 3rd grade students for understanding of self and others. Mass (1977) reports no significant effects of paraprofessional training on the self-esteem of a volunteer group. However, there is a serious confounding of effects along her group dimension, with only the group trained in peer counselling consisting of volunteers. The less trained group consisted of preceptors already working in their college residence; and the control group simply of residence dwellers. Pre-existing differences between groups could easily have acted against the effects of the experimental treatment. If volunteers are extreme along any dimension, one would expect unequal regression toward the mean over multiple measures, as were taken in this design. On the other hand, it may be that there is something special about the helping interaction in its effect on the helper. The available data support the notion that it is not the training, but the helping, that produces positive effects on the helper, be they measured as increases in academic skills, self-concept, self-acceptance, or self-understanding.

A number of reports concerning the attributes of the effective peer counsellor become pertinent here, because if he/she can be of initially lower self-esteem, self-confidence, self-understanding or skills, and the peer intervention process still be deemed successful, one begins to wonder exactly what the determinants of the effective peer counsellor are. Baldwin (1975), reporting on a carefully designed program for student-to-student counselling, lists the following requirements for acceptance as a counsellor at the University of Wisconsin Center. Potential counsellors must understand carefully laid out objectives, and be:

1. interested in the program;
2. able to interpret the objectives;
3. familiar with the materials;
4. acquainted with regulations and procedures;
5. knowledgeable concerning services;
6. able to interpret tests and use data;
7. familiar with and able to demonstrate good study techniques; and,
8. stable academically.

Briefly reviewing this list, it is evident that only the first item relates to counsellor personality. Baldwin's list concentrates on skills which may be taught in intensive sessions (items 2-7), and on the interest which would motivate completion of such sessions (item 1). Finally, it is likely that the last item, far from being a requirement, may be a result of peer intervention (Gardner, 1978). The limitations of this list notwithstanding, it does provide a baseline set of requirements for counsellor effectiveness.

Counsellor sex has been assumed to be a factor influencing counselling effectiveness more often than it has been investigated. Many studies use only like-sexed dyads under this assumption (e.g., Zunker and Brown, 1966). Kaplan *et al.* (1976) report that at a women's self-help telephone service in Baltimore, there was a theme running through the calls which was more understandable to women who have experienced the same difficulty as those using the service in trying to do something productive for and with oneself. Although one cannot argue with their argument that women counsellors represent a rich resource for dealing with such calls, as men were not evaluated, one cannot determine whether or not men represent a potential resource of the same calibre.

In general, self-help groups use members of one sex, or of one sexuality. For example, Stern (1975) reports the success of a self-help group of homosexuals on Chicago's North side. One can barely imagine non-homosexuals producing the reported level of success with this population of client, but it is questionable whether the lack of success would result from lack of ability, or lack of interest and/or commitment. Due to the lack of control in reports of the activities of self-help groups, relatively few firm conclusions may be drawn concerning this type of counselling service.

Several reports have concerned personality variables as a determinant of counsellor effectiveness. Typically, empathy is mentioned as a necessary prerequisite (Baldwin, 1975; Eisenhart, 1977). Empathy-related variables interacted with sex-related variables on the Edwards Personal Preference Schedule to differentiate potential counsellors as selected by Ohio College freshmen via questionnaire (Holler, 1976); but not via testing of prisoners in Indiana (Cahill, 1976). When German (1976) tested more- and less-effective counsellors at a Boston college, no empathy-related dependencies were found. Thus, although counsellor empathy is expected to be an important factor in determining counsellor effectiveness, hard evidence confirming this has proven difficult to obtain. Further research is necessary to evaluate the relationship between personality factors and counsellor effectiveness. As it stands, short of severe organic limitations and/or lack of interest, no counsellor variable has been conclusively associated with counsellor accomplishments.

Discussion

A very important lack in the literature concerning peer intervention techniques is mentioned by Durlach with reference to peer counselling. There is, by and large, no significant consideration of possible mechanisms of these techniques. It is possible that the lack results from the absence of reported failures in the literature using these methods. If nothing fails, how does one determine how it is that successes occur? A parallel will serve to demonstrate why mechanistic considerations are so very important. At the 1975 annual meeting of the Canadian Psychological Association in Quebec City, a session on the effects of electromagnetic fields on behaviour was held. One presentation given concerned orienting responses in birds, and was interpreted in terms of the migratory patterns of the species tested. Another paper concerned lever pressing behaviour in monkeys, and demonstrated changes in this behaviour induced by rotating an electromagnet about the cage. The results were significant, but wholly confusing. The investigator reporting did not interpret them in terms of possible reasons why the effect should occur (nor could anyone else, judging from the discussion which followed). If I were granted special knowledge that there was a type I error among these papers, I would guess it to be this latter one. Logically, induction is never fully justified (Campbell and Stanley, 1966). The strength of an induction varies not only with the strength of a reported effect, but also with the strength of the discussion of the meaning of the effect. The almost universal lack of careful empirical consideration of the mechanism of the peer intervention effect is a severe limitation to the power of induction in this area.

Another limitation to the conclusion-supporting power of the data in this area is the lack of variation produceable by various treatments. It may be said that all a scientist has to work with is variance, that information is entirely co-existant with variation. For example, if no kind of intervention helped anyone change anything, it would be difficult to draw any conclusions about the nature of the intervention effect. This would be unfortunate, but relatively unimportant in any applied sense, as no effect is present. Conversely, when faced with an area where all sub-types of peer intervention help everyone change anything, it is equally difficult to draw conclusions about the basis of the effect, as all treatments are effective. It is also equally unfortunate, but more important, because important effects are reported. Therefore, some of the variables which are possibly related to the peer intervention effect are discussed immediately below.

In 1968, Lowenthal and Haven published a sociological report with important implications for peer intervention technology. They were investigating the relationship between traditional measures of social deprivation on the one hand, and morale and psychiatric condition on the other, among older people. They found the expected relationships (age-linked trauma linked with low morale), but they were by no means universally so. Investigating further, they found that "the happiest and healthiest among them often seemed to be people who were, or had been, involved in one or more close personal friendships" (p 371). In fact, maintenance of a stable intimate relationship with a confidant is more closely associated with good mental health and high morale than is high social interaction or role status. The loss of a confidant has a more deleterious effect on morale than does a reduction in either of the other two social measures. Although the knowledge that one has had a close personal relationship in the past softens the impact of decreased social interaction or reduced social roles, apparently it does not elevate a mood depressed by the loss of a confidant.

The notion that the effects of peer counselling might stem from the provision of potential confidants and encouraging the establishment of close friendships was tested by Barrett (1978), however, no differences between confidant, self-help, or consciousness-raising orientations were measured. In fact, every group improved over the program, including the control group, who were simply put on a waiting list. The presence of these "placebo" effects of peer intervention, plus the biases toward perception of effectiveness among dyads matched along other variable points to a particularly pointed need for levels of control generally lacking in this research area. In addition, the necessity of objective follow-up measures taken (for example) a year after intervention had been terminated is also clear from the reported effect (Lowenthal and Haven, 1968) of loss of a confidant. Generally, follow-up measures are absent in this literature. This lack of control could be the basis of the reported effects.

Differential effects of motivation have been mentioned as important in discussions of the peer tutoring data (Spilerman, 1971; Slogget, 1971). A lack of competition fostered among members of a developing population has a demonstrable positive effect among certain minority groups, and perhaps among minority populations in general.

Another mechanism which may be important in producing the peer intervention effect is the training so universally present in applications of peer techniques. Statements regarding the necessity of specific training notwithstanding, general orientation and selection of volunteers have proven sufficient in a number of reports. Specific training regarding sexual problems has been shown to alter response patterns toward the more effective in experienced counsellors (Zweibelman and Hinrichsen, 1977). Durlach (1979) notes that the presence of specific targets, and the use of specific training characterizes the reports providing the strongest evidence of peer intervention effectiveness. Self-help groups by definition involve the use of counsellors with specific common experiences which have elements similar to training. The notion that training a counsellor helps raise effectiveness is the basis of professionalism, and is hardly a landmark finding. However, the information that limited training produces counsellors who are more aware of their limitations is interesting and useful.

The mechanism of the effect of intervening on the intervenors can be traced to the superior motivational power associated with co-operation in some groups, or to the desire to accumulate success experiences in order to have a good self-concept. When using success counselling (Washington, 1977), a group method which has been applied among adolescents lacking in self-confidence, clients are requested to recall events in their lives where they had experienced success. Recalling such occasions generally has a therapeutic influence on self-esteem. Some examples of experiences reported in such groups are awards and honors obtained by belonging to youth groups or by participating in school activities. It is apparently good for one's self-concept to have recollections of helping, or of being recognized and rewarded for one's efforts. Acting in a peer intervention role certainly constitutes such an experience.

However, there are problems associated with the use of non-professionals in professional roles. Some of these are reviewed by Allen (1973), who lists seven functions properly under the control of professional organizations. These are:

1. overall planning of training and service programs;
2. role definition, specification of job functions, expectations, and limitations;
3. training;
4. client acceptance;
5. career mobility;
6. monetary compensation; and,
7. legal liability.

Clearly, all these areas must be controlled in any serious intervention effort. Self-help groups excluded, professionals generally still control items 1-3 in programs using peers. These programs are also very effective where professionals would have trouble gaining client acceptance. However, items 5-7 are typically left uncontrolled. Some programs pay a small salary to peer counsellors, but it may not be assumed that cheapness will always characterize paraprofessional intervention techniques. Little thought is given to recognition of training through certificate or license to provide for career mobility. This oversight cannot continue without unfair consequences. Finally, legal liability has been left thoroughly undiscussed. These special problems with the use of non-professionals should be addressed as they apply to any particular project by every potential user. Otherwise, there are apt to be unwanted and unnecessary drawbacks to anything other than the most ephimeral of pilot explorations of paraprofessional services.

In light of potential problems with the use of paraprofessionals, some inexcludable hypotheses of the mechanism of the reported effects of peer intervention become more important. These hypotheses may be said to trivialize these effects, in that the explanations they offer are in terms other than those of primary interest to investigators in this field. For example, the tendency for both client and counsellor to respond favorably on questionnaires when they perceive one another as sharing much in common (Johnson, 1977) can be taken as an explanation of most of the questionnaire data reported in this area. By definition, peers (people from a target population) share much in common with their clients. All questionnaire data reported in isolation from more objective measures of success must be nearly discounted in arguments from which success is to be empirically induced. In addition, studies involving counselling among seekers as compared with no counselling among non-seekers suffer from a regression confounding which renders them nearly uninterpretable. Any group selected on a pretest for extremity is expected to perform more like an average group on subsequent testing (Campbell and Stanley, 1966). Such a change without appropriate controls would resemble the effect of a useful treatment. Regression towards the mean is an undeniable possible contributor to some of the successes reported for peer intervention.

When peer counsellors are compared with professionals, there are additional explanatory factors whose effects should be investigated (Durlach, 1979). For example, these comparisons are usually made in problem areas where professional help produces notoriously unremarkable effects (Gruver, 1971), or using subject populations not usually seen by professionals (Hamburg and Varenhorst, 1972). For example, how professional intervention would function in a system whose goal it is to socially adapt freshmen to post-secondary education is questionable.

Further, professionals used typically differ from peers along numerous dimensions important to the goal of the system (Zunker and Brown, 1966). In addition, professionals would be more remote from many problem areas. Adjustment guidance clearly differs from counselling, so an attempt has been made to discuss it separately. Some of the strongest support for peer intervention comes from the uses of guidance and tutoring. This support may not be taken to apply to counselling, where professional intervention might be more appropriate, or where its expectation of success might be higher.

Another explanatory variable is that of characteristic approach: group *vs* counsellor/client dyad (and everything in between). Sometimes, when professionals are compared with paraprofessionals, the professionals either have a larger case load (Zunker and Brown, 1966), or see clients in groups while paraprofessionals see fewer clients, or in dyads, or both. Investigators of peer tutoring typically compare teaching of classes with individual or small group tutoring. Where such comparisons are made, relative effectiveness of peers and professionals is not being examined independently. Thus, the approach variable is possibly an important one in project design. It is a good guess that a carefully supervised dyad approach will prove to be most effective.

None of these alternative hypotheses may be entirely excluded on the basis of the available data. Neither can it be denied that the most extremely positive statements regarding the effectiveness of peer intervention come from progress reports of experimental projects. Such projects are subject to effects due to novelty. Considering this, the necessity of objective follow-up reappears. Too often, experimental programs are designed in such a way as to fail to be even quasi-experimental. Such programs provide no clear basis for evaluation of their usefulness. They do not even "probe" the truth, far less "prove" it (Campbell and Stanley, 1966). Any reasonable program must have in it some useful basis for evaluation. Given this restriction, many of the available reports may be seen to be unreasonable and uninformative. There exist methods to render confounding unlikely in non-experiments, and statistical tools to extract information while avoiding the (perhaps inappropriate) hypothesis testing approach. Where a full experiment does not fit the nature of the project, these methods should be used to avoid biases of suspected or unsuspected origin.

Suggestions for future research

Peer intervention systems deserve study of a more careful nature than has been typically done. The uniform reports of success are promising, the general lack of control and design elegance disquieting, and the possible alternative investigative approaches numerous. It appears that financing for such projects is currently relatively easily justified. However, some level of control must be achieved, or one suspects that financing will become less justifiable in the future, due to a lack of information return.

More subject or target problems warrant investigation. One specific area which merits more attention is career guidance. As a specific problem area, findings are promising for successful use of peer techniques. Guidance in an area like this is also more like tutoring, where more positive support is available, and where peer intervention has a longer history. It is clear that, given the provision of appropriate materials, peer intervenors need not be much better than the "client". Motivation to co-operate will probably be high, given recent increases in group identity among the unemployed (or potentially unemployed) through the media. Given sufficient supervision and understandable materials, professional orientation, -availability, and-recognition, peers from this group could effectively assist one another. Objective measures of success must be taken, and modes of analysis useful with developing systems instituted to determine the effects of the program (e.g. path analysis, time series analysis). Control groups and follow ups should be included, and the program instituted for a long enough time as to determine novelty effects. Several target populations should be used, and perhaps brought into dyadic contact with each other (e.g. the chronically unemployed and high school students, housewives and female students, etc.). A "buddy system" within these populations might prove useful or even necessary for success. Many other specific problem areas should be investigated, with attention to design, control, and long-term analysis. Given the unanswered questions about the possible negative effects of the lack of a responsible professional group, the utility of peer intervention should be carefully determined prior to its widespread institution.

It may be remarked that peer intervention is already in widespread use. It is hoped that this discussion will cause the reader to view this fact with some increased concern for immediately determining under what conditions which methods are effective, useless, or harmful, and what legal or other problems may ultimately arise from their use.

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Automated Assessment of Vocational Aptitudes: A Feasibility Study

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Chapter 1

The Computer and Ability Testing

Introduction

Automation has become a viable solution for certain problems encountered in our complex society. Industrial, educational and health concerns are increasingly dependent on computer technology for gathering, assessing and storing necessary information. Computer technology, which has advanced rapidly in the last decade, is now widely employed in areas ranging from leisure pursuits to business administration. Microcomputers are now appearing in private homes where they are used for domestic purposes. An automated system can be a practical and economical solution to a tremendous variety of problem situations. The ability to store information on large numbers of people, and the ease with which this information can be extracted, are of major significance. The cost factor involved was once prohibitive, especially where a number of qualified personnel was required. Not only have the costs of computer technology fallen significantly in the last few years, but, even with the minimum of personnel, the ease with which data can be manipulated on an automated system allows its application to a wide variety of areas.

In medicine computer-based interviews of adults and adolescents have proved successful in collecting extensive historical and psychiatric information about a patient and summarizing the pertinent details for use by the specialist, thus saving professional time. Giebink, Hurst, Foreman and Elser (1975) provide an extensive review of computer applications in ambulatory health care systems and Coddington and King (1972) describe a child psychiatry automated interview.

A history-taking assessment procedure developed by Knights was found to be reliable over time and when compared to histories taken by doctors or forms filled out by parents for their children (Knights and Cunningham, 1977). This interactive pediatric questionnaire is administered to the child's mother via a teletype terminal and asks approximately one hundred multiple-choice questions regarding the child's medical, social and personal history. Immediately after the interview, the computer makes available a summary of the patient's history, showing pertinent information for use by medical personnel. Branching within the program is dependent upon responses made to critical questions. The potential for more complex decision-making is greater than if the interviewer were to rely on an interpretation of answers to a simple written questionnaire.

Large numbers of individual results can be stored, with the advantage of immediate retrieval on request. Summarized and statistical analyses of results can be generated on an ongoing basis.

Other advantages of automated interviewing or testing include the potential to vary test parameters. The amount of time that the question is displayed, the allowable response time, the use of colour and the size and orientation of the figures shown are variables that are easily manipulated in a precise manner with computer administration.

These parameters can be easily changed for the full period of the test or during the test itself. This can be done on a predetermined basis or based on the results that are obtained during the test. For example, if good results are obtained on early test items then the display and the allowable response time may be shortened. Alternative test sequences may be carried out, based on the test results reported on a number of different items. For example, if the examinee shows a perfect score with excellent response times on the first five items, then the remaining, similar items may be omitted. It may then be possible to focus on areas of most value for each individual being tested.

Another advantage of automated assessment is the potential for measuring and storing individual response times, not only to complete tests but to single items incorporated in them. This can be of significance in detecting, to a greater degree of accuracy, the latent skills and limitations of the examinee.

With no effort on the part of the tester, the tests may be marked instantaneously and stored for later reporting. Statistical analysis of results may be easily performed without data re-entry, and results on tests of aptitudes, for example, may be combined with results on occupational choices to provide an indication of suitable career opportunities.

Literature Review: Computer Assisted Testing

There have been only a few published studies of the use of automated testing since the pioneering work of Elwood (1969). Overton and Scott (1972) investigated the feasibility and reliability of an automated version of the Peabody Picture Vocabulary Test. In a comparison of automated and clinical administration of both Forms A and B of the test with institutionalized retarded, they found that the children interacted satisfactorily with the terminal. Both methods of administration produced high test-retest correlations and there were no significant differences in scores between methods of presentation. Johnson and Mihal (1973) examined the scores of grade seven and eight Black and White students on the Cooperative School College Ability Test in an effort to assess the importance of tester–testee relationship.

They found that Blacks obtained higher scores with the automated administration than with the manual administration and concluded that the automated version did not produce the anxiety that occurs when tests are administered by testers from more advantaged backgrounds. Suppes, Fletcher, Zanoti, Lorton and Searle (1973) have modified portions of the Stanford Achievement tests for automated testing. They have found these useful in assessing mathematics skills and especially in evaluating the effectiveness of a CAI training course in mathematics for deaf children. The large and well known Computer Aided Instruction (CAI) projects such as those at Stanford (Atkinson, 1974), Illinois PLATO (Bitzer, Sherwood and Tenczar, 1973) and the University of Pittsburgh IPI (Cooley, 1970) administer automated assessments as pre- and post-tests within their computer-aided instruction programs. These tests make use of the criterion referenced procedure to determine the child's abilities (or mastery level where he reaches a criterion) in a specific area of instructions. These assessments have proved to be reliable and efficient.

Standardized psychological tests have also been successfully automated. Computer-based versions of tests such as the Wechsler Adult Intelligence Scale (Elwood, 1972; Elwood and Griffin, 1972; Orr, 1969), the Peabody Picture Vocabulary Test (Overton and Scott, 1972; Knights, Richardson and McNarry, 1973), and the Coloured Progressive Matrices, the Category Test of Abstract Reasoning and the Continuous Performance Test (Knights and Richardson, 1974) have shown good reliability in the automated form and high correlations with the manual versions of the tests. Interaction between the subject, and the computer terminal has been highly satisfactory. (Knights, 1982). In fact, it has been shown that with some subjects, computer administration is more cost effective than administration by a professional (Elwood, 1972).

A study by Guarnaccia, Daniels and Sefick (1975) investigated the effect of automated versus standard instructions on performance on the Purdue pegboard in mentally retarded adults. It should be pointed out that only the instructions were automated through the use of video tape and audio instructions.

Both types of administration yielded equivalent scores — except on the assembly part of the test. Test, re-test correlations over a two month period of time showed both types of administration to be equally reliable. The additional practice time allowed by the automated presentation may explain the higher mean score in the assembly area. The influence, on the test, of the practice period permitted before the actual test begins, is an aspect that must be carefully considered when conducting automated testing.

Only two studies have been located which utilize the unique capabilities of computers for testing a variety of abilities. The first by Tapley and Bryden (1977) was primarily directed toward an examination of sex differences in spatial ability. Of interest for this review is the correlation between paper and pencil spatial aptitude measures and computer presented graphics. The paper and pencil tests included the Spatial relations subtest of the Differential Aptitude test, an Imagery questionnaire and a Road Map test of direction sense.

Following the administration of the above tests, male and female subjects were given the mental rotation task in which two-dimensional computer-generated representations of three-dimensional objects were used.

The figures were paired so that there was an equal number of same and different pairs. One hundred pairs were constructed, thereby giving 10 same and 10 different pairs for each of the 0, 40, 80, 120 and 160 degree rotations. Each subject was presented with a stimulus figure together with one that had been rotated, and had to choose whether the latter figure was the same as the stimulus.

In general, men were more accurate than women in determining the degree of rotation. Of particular interest is the significantly high correlations between both Spatial Abilities and Road Map tests and the scores on the computer presented graphics for both sexes. The Imagery test correlated significantly for men only. This study again demonstrates similar performance on automated and standard tests, in this case Spatial Abilities.

In the literature review, the most unique study, using computer presentation to examine a wide variety of abilities, was conducted by Cory, Rimland and Bryson (1977). For computer presentation they developed three memory tests: memory for objects, memory for words and digit span memory; three spatial tests: comparing figures, recognizing objects and pattern recognition; and two reasoning tests: twenty questions and computerized password. The spatial tests included features such as intermittant exposures, gradually increasing detail and minor orientation differences which are not reproducible in the standard paper and pencil tests.

The standardized paper and pencil tests from the Educational Testing Service Kit of Tests of Cognitive Factors included: memory for objects and memory for numbers; spatial tests of: counting numbers, Gestalt completion, word perceptual closure, hidden patterns and drift direction; and reasoning tests of nonsense syllogisms and drawing inferences.

The results are complex and interesting. Memory test scores were similar in both methods of presentation, as were the spatial perceptual speed tests. The tests which were unique to computer presentation, such as those including movement and perceptual closure, did not relate highly to the paper and pencil tests. The reasoning tests presented in both automated form and as paper and pencil tests showed low correlation. This was likely due to the fact the types of reasoning in the two methods were different. In general the results of the study suggest two major important findings. First, when similar tests are presented by either an automated or standard method, the results are similar. Second, it is possible to test perceptual and spatial abilities via computer that are not assessed by currently available standard aptitude tests.

Summary

The studies of computerized testing indicate a variety of abilities can be reliably assessed. The mode of stimuli presentation, computer or paper and pencil, does not significantly affect the resultant score. There is no suggestion that the mode of response, such as using a pencil versus pressing a keyboard button affects the score. Finally, not only can the usual aptitudes sampled by standard tests be measured, but different abilities can be sampled as a result of the graphic capability of computers.

Chapter 2

Aptitudes Measured by the General Aptitude Test Battery

The GATB was developed by the United States Employment Service for use by vocational counselors. Prior to the publication of the battery, factorial analyses were conducted on large preliminary sets of tests and after several revisions the number of tests was reduced to twelve. These tests are described as follows:

Part 1 — Name Comparison
The examinee must inspect pairs of names and indicate whether they are the same or different.
Measures Clerical Perception.

Part 2 — Computation
The examinee is required to add, subtract, multiply and divide whole numbers.
Measures Numerical Aptitude.

Part 3 — Three-Dimensional Space
A stimulus figure, pictured as a flat piece of metal with lines indicated where it can be bent, is given. The examinee must choose which one of four drawings of three-dimensional objects can be made from the stimulus figure.
Measures Intelligence and Spatial Aptitude.

Part 4 — Vocabulary
The test consists of sets of four words from which the examinee must choose two that have the same or opposite meanings.
Measures Intelligence and Verbal Aptitude.

Part 5 — Tool Matching
A stimulus figure and four black and white drawings of simple shop tools are given. The examinee must indicate which of the four drawings is the same as the stimulus figure. Variations exist only in the distribution of black and white in each drawing.
Measures Form Perception.

Part 6 — Arithmetic Reason
A number of arithmetic problems are expressed verbally.
Measures Intelligence and Numerical Aptitude.

Part 7 — Form Matching
Two groups of variously shaped line drawings are given and the examinee indicates which figure in the second group is the same as the one in the first group.
Measures Form Perception.

Part 8 — Mark Making
In a series of squares, the examinee must, as quickly as possible, make two short, vertical, pencil lines and a horizontal line beneath them.
Measures Motor Coordination.

Part 9 — Place
The equipment used for this test is a rectangular pegboard divided into two sections, each one containing 48 holes. The upper section holds 48 cylindrical pegs which the examinee removes and inserts into corresponding holes in the lower part of the board. Two pegs must be removed simultaneously, one in each hand, as rapidly as possible. This performance is done three times.
Measures Manual Dexterity.

Part 10 — Turn

The same equipment as in Part 9 is used. The lower section contains the 48 cylindrical pegs one of which the examinee removes and turns over so that the opposite end is up, and returns to the hole from which it was taken, using only his preferred hand. Again, three trials are allowed and the examinee must work rapidly.

Measures Manual Dexterity

Part 11 — Assemble

A small rectangular board (Finger Dexterity Board), containing 50 holes and a supply of small metal rivets and washers is given. With the preferred hand, the examinee takes a rivet from a hole in the upper part of the board and, at the same time, removes a washer from a vertical rod with the other hand. The washer must be put on a rivet and the assembled piece inserted into the corresponding hole in the lower part of the board. This must be done as quickly as possible.

Measures Finger Dexterity.

Part 12 — Disassemble

The Finger Dexterity Board is also used for this test. The examinee removes the small metal rivet of the assembly from a hole in the lower part of the board, slides the washer to the bottom of the board, puts the washer on the rod with one hand and the rivet into the corresponding hole in the upper part of the board with the other (preferred) hand. The examinee works rapidly to move and replace as many rivets and washers as possible during the time allowed.

Measures Finger Dexterity

Table 1 lists the 12 tests and the 9 factors derived from the tests. An impressive body of data has been accumulated on the GATB and continuing research is in progress. Both the equivalent form and retest correlations cluster in the .80's and .90's for the verbal tests and somewhat lower for the spatial and coordination tests (.65 to .75). Both predictive and concurrent validities have been investigated, but the large majority of the studies have used only concurrent procedures. Most of the studies relating scores to job performance cluster around .40 with the verbal tests slightly higher and the spatial or motor coordination tests somewhat lower. (Anastasi, 1982).

These twelve tests may be divided into three groups in terms of the stimulus response characteristics required for computer administration. These groups include the verbal tests which require only text, the spatial tests which require graphic capabilities, and motor coordination tests which require additional apparatus.

Table 1

Aptitudes measured by the GATB

Aptitudes	*Tests*	
G - General Learning Ability	Part 3	Three Dimensional Space
	Part 4	Vocabulary
	Part 6	Arithmetic Reason
V - Verbal	Part 4	Vocabulary
N - Numerical	Part 2	Computation
	Part 6	Arithmetic Reason
S - Spatial	Part 3	Three Dimensional Space
P - Form Perception	Part 5	Tool Matching
	Part 7	Form Matching
Q - Clerical Perception	Part 1	Name Comparison
K - Motor Coordination	Part 8	Mark Making
F - Finger Dexterity	Part 11	Assemble
	Part 12	Disassemble
M - Manual Dexterity	Part 9	Place
	Part 10	Turn

Verbal Numerical Aptitudes

In general, verbal abilities constitute the major factor in tests of intelligence. Vocabulary, or word definitions is the single greatest predictor of the IQ score. A large number of factor analytic studies have identified ten or more different types of verbal skills and the most well known individual test of intelligence, the Wechsler Adult Intelligence Scale includes six Verbal subtests: Information, Comprehension, Arithmetic, Similarities, Digit Span and Vocabulary. The GATB includes four verbal tests: Name Comparison, Computation, Vocabulary and Arithmetic Reasoning, which correlate highly with the Wechsler Verbal Scales.

An interesting finding regarding verbal skills, is the general agreement that for nearly everyone, even left-handed individuals, language skills tend to be localized in the left cerebral hemisphere (Hecaen and Albert, 1978). The implication of this finding for aptitude testing is that an individual's verbal skills may be compared to his spatial skills, and allow inferences to be drawn regarding the functioning of the left and right cerebral hemispheres and hence the integrity of the neurological system. This point will be elaborated in Chapter 3.

Spatial-Perceptual Aptitudes

Measures of spatial ability assess the capacity to visualize and manipulate objects in space, such as how figures match or look when related or fit together. The GATB tests of Three-dimensional space, Tool-matching and Form-matching sample spatial skills and are used to predict performance for pilots, artists, engineers and tool makers.

The general predictive power of spatial tests for a variety of vocational occupations tends to be slightly better than motor tests, however the overlap is great and the relationship complicated because of the difficulty in sampling spatial skills separate from motor skills (Ghiselli, 1966). Most tests in this area require both motor and spatial skills and are frequently referred to as perceptual tests.

There is a great deal of evidence that spatial skills are mediated primarily by the right cerebral hemisphere of the human brain (Hecaen and Albert, 1978). The implication of this finding is that test batteries which include both verbal and spatial measures may allow inferences regarding the neurological functioning of the left and right cerebral hemispheres. This will be discussed more extensively in Chapter 3.

Motor Coordination-Dexterity Aptitudes

Many tests have been devised to measure motor coordination and speed. Most are concerned with manual dexterity that may be specific to a certain job. Motor tests are characteristically apparatus tests such as the tests of Place, Turn, Assemble and Disassemble of the GATB or the paper and pencil test such as Mark Making. Available evidence indicates that there is little correlation between printed tests and apparatus designed to measure the same motor functions (Fleishman, 1958). In addition the research has revealed that motor abilities are highly specific to the job demands. Fleishman's (1972) extensive factor analytic investigation identified eleven specific perceptual motor factors of which five are measured by the GATB. In general, motor tests have been most successful in predicting job performance on routine assembling and machine operating jobs (Ghiselli, 1966). For this reason, a number of these tests were included in the GATB.

Evaluation of the GATB

The GATB was designed by the United States Training and Employment Service (USTES) over 35 years ago for a society that had recently developed mass production technology. Although it is, according to its authors "the best validated multiple aptitude test battery in existence for use in vocational guidance" (Foreword, GATB Manual, Section 1) its psychometric characteristics and method of use have been severely criticized and detailed reviews are available (Anastasi, 1982; Weiss, 1972).

The nine factors which are included in the GATB were identified on the basis of a factor analytic study of 59 tests in use with the U.S. Employment Service in 1947. The twelve tests used in the GATB were then selected somewhat arbitrarily according to two criteria: — factorial validity and validity against external criteria. In some instances tests with high factorial validity were rejected in favour of those with greater concurrent validity. (GATB Manual, Section IV).

The original method of factor analysis of the 59 tests has been re-evaluated by Watts and Everitt (1980). They conclude the nine factors have doubtful validity and in fact the test samples only three factors: 1) symbolic (numerical-vocabulary) 2) perceptual (spatial-perceptual) and 3) psychomotor (coordination-mechanical). The composition of the "G" factor has been criticized since it is no more than a linear combination of the V, N and S factors and has no differential utility for prediction (Weiss, 1972).

Other criticisms of the psychometric properties of the GATB include the multiple cutoff method for determining whether an individual fits a particular Occupational Ability Pattern (OAP). No information is provided regarding the success rate of an individual who fits one or more of the OAP's. Weiss (1972) also questions the USTES use of the multiple cutoff approach compared to curvilinear regression or other prediction methods. All of the GATB tests are speed tests which penalize individuals who work slowly or are poorly coordinated. The emphasis on speed may be particularly important in group administrations of the test where group pressure may cause increased anxiety and affect performance. Moreover, the GATB has several sets of tests, such as the two arithmetic tests, which are highly correlated. In addition, the GATB does not include tests of mechanical comprehension, reasoning or creativity, which are important for adequate evaluation of an individual. Other criticisms of the test relate to its scoring and interpretation. Although the instructions are carefully standardized, scores on the motor coordination and manual and finger dexterity tests do not indicate marking errors or dropped pegs or rivets. The interpretation of the test results does not take into account the meaning of differing profiles of results and the test norms for specific occupations only take into account information on three or four particular subtests.

Finally, the GATB suffers from the inherent weakness of a test designed in the 1940's to evaluate perceptual and coordination skills required for blue collar workers. It has not been revised to sample modern skills related to computers, automation, electronic and high technology in business, manufacturing and education.

Chapter 3

Screening for Potential Neurological Problems

It may be possible, on the basis of GATB to identify individuals who are at high risk for neurological difficulties. The essential feature of this technique is to examine the pattern of sub-tests on the GATB in a variety of ways, based on current knowledge in neuropsychology and neurological assessment techniques (Golden, 1981). The assumption on which this method would be designed is that some individuals would be identified for referral to a neurologist for detailed examination. The goal here is, not to accurately diagnose neurological conditions in clients, but rather to select out those who appear to have some basis for suspicion of a neurological deficit so that they may be counselled to see their physician for preliminary neurological assessment.

The method of selecting these high risk clients is based on four methods of data analysis:

Methods of Analysis

1. Level of Performance

In general the level of performance on the twelve sub-tests would be recognized as an important variable if the average score of the client was two standard deviations below the mean or a score of 59 or lower. This is an unlikely event since a reading grade level of approximately grade 6 is required in order to take the test.

2. Left-Right Differences

Comparisons of the performance of the two body sides is one of the most potent predictors of brain damage or dysfunction. It is known that the dominant hand performs slightly better on most motor tasks than the non-dominant hand. Right-left differences of a large magnitude are excellent indicators of dysfunction of one or both cerebral hemispheres. In order to use this method of evaluation one of the tests would have to be given separately to both hands. The test best suited for this is Part 10, "Turn", which is already given to the dominant hand. The procedure would be to modify the instructions slightly so that the subject is asked to perform the same task a second time using the non-dominant hand. This additional task could easily be included in the administration of the GATB.

Since this is a new method of administering the test, a comparative study would have to be carried out in order to determine the magnitude of differences that are significant. That is, it is assumed that the individual will perform more slowly with the non-dominant hand, but the ratio of normal differences must be established. Since a general study would be required to determine the accuracy of identifying potentially neurologically impaired clients, this modified procedure could be included in the general study. In addition, it is unlikely that adding this extra trial would have any effect on the standardized GATB administration.

3. Verbal-Spatial Differences

In clinical neuropsychology it is now widely recognized that verbal and spatial abilities tend to be localized in different parts of the brain. In a high percentage of adults verbal skills are mediated by the left cerebral hemisphere while spatial abilities are mediated by the right cerebral hemisphere. This is usually the case for both right and left-handed individuals. This information could be used by comparing the client's performance on the verbal tests versus his performance on the spatial tests. That is, standard scores on parts 1, 2, 4 and 6 would be compared with the standard scores on parts 3, 5 and 7. Most individuals would score approximately equally well on these two types of tasks, therefore, large differences would be used to identify a neurologically impaired client. Again the magnitude of the difference to be considered important would have to be determined empirically.

4. Inter-test Differences

A final method of assisting in the identification of neurological impairment is to utilize the sub-test variability. This could be accomplished in two ways. Firstly, by looking at the variability among each of the twelve sub-tests and, secondly, by comparing the variability in the three areas: verbal, spatial and motor-coordination. For example, a client who has two or more sub-tests that vary among each other more than two standard deviations may be considered a candidate for the neurological referral.

In order to utilize these four methods of data analysis an empirical study would need to be conducted on a sample of individuals, who are known to have neurological impairment, and a comparison group, who are known to have no neurological impairment. This type of study could be conducted, for example, at the rehabilitation unit of the General Hospital, where medical information would already be available. A sample of normal controls could be collected from some other department at the hospital.

Accuracy of Classification: Hit Rate and Base Rate

One of the common difficulties encountered in making a diagnostic classification is the accuracy of the hit rate (Gordon, 1977, Crawford, 1974). That is, does the classification technique allow correct identification of those patients who have a particular disorder from those patients who do not have this disorder? Typically in classification studies there are always some false positives, that is, individuals who score on the test as if they have the disorder but who do not, and false negatives, or those individuals who have the disorder but whose scores are in the normal range. The type of error made depends in part on the cutting score utilized to identify the impaired population (Rorer, Hoffman, LaForge and Hsieh, 1966). If the cutting score is high, then the likelihood of obtaining false negatives increases, while if the cutting score is low, there is an increased probability of finding false positives. In order to determine the number of false positives or false negatives as function of a specific cutting score, a study would need to be done with a group of impaired individuals contrasted with a group of normal individuals as has been discussed in the previous chapter.

Another issue to be considered in the attempt to identify potentially neurologically-impaired individuals is the base rate of that condition in the individuals who have taken the GATB. That is, if only a very few clients assessed do have some degree of neurological damage, a considerable amount of time and money would be spent in order to identify relatively few people. For example, if only one percent of those who take the GATB have neurological impairment, it is extremely difficult to use test scores to identify the neurologically-impaired individual given this low base rate of one percent. It would be less expensive in terms of both time and money to use the base rate itself as a method of prediction. That is, if we predict that the individual falls into the non-impaired normal group we would be correct 99% of the time. In addition, the cut-off score would have to be adjusted to the extreme end and therefore would produce a substantial number of false negatives.

If, however, the frequency of neurologically impaired in those tested is approximately 20%, one should be able to identify individuals with relatively good accuracy with a low error rate in classification. A project to establish the formulae for cutting scores to ensure relatively good accuracy in classification would require testing of neurologically-impaired and normal individuals as well as analysis of GATB profiles from the Employment Center.

Chapter 4

Automated Assessment of Vocational Aptitudes

1. *New Aptitudes Only Measurable by Automated Procedures*

The use of the computer in the testing situation allows the measurement of a number of new aptitudes required in today's technological society, which cannot be measured using traditional paper and pencil techniques. New abilities which can only be tested using computer technology range from information processing to the dexterity required to track a moving stimulus.

Three-Dimensional Space

The graphic capabilities of the modern computer provide the opportunity for measuring a variety of visual processes which cannot be evaluated in the two-dimensional mode of paper and pencil tests. The use of the computer to measure the spatial ability required to perform a mental rotation of three-dimensional objects has been described in Chapter 1 (Tapley & Bryden, 1977). This ability is particularly relevant to modern business applications where a three-dimensional object is displayed on a VDT in a number of rotations to allow it to be observed from different angles.

Information Processing

The information processing abilities of the human individual may also be assessed uniquely via computer presentation. The computer may readily be programmed to display intermittant exposures of an object in gradually increasing detail (Cory, Rimland and Bryson, 1977). The speed at which the individual is able to identify correctly the object displayed provides a measure of the amount of information required by the individual to perform this identification. This ability is important in occupations requiring pattern recognition, such as a radar screen operator or flight controller.

Vigilance

A second aptitude essential to these types of occupation is vigilance. The VDT provides the ideal opportunity to measure both visual and auditory vigilance in terms of the individual's ability to respond to visually presented dots or auditorally presented blips under a variety of different conditions.

The individual may be required to select the stimulus from a distracting visual array or background noise as in the case of air traffic controllers. A second variable of interest is the assessment of vigilance over time, where the individual must respond to an infrequently occurring stimulus in spite of fatigue and boredom. This would be required, for example, by a sonar screen operator.

Movement Perception and Manual and Finger Dexterity

One of the most significant advantages of computer assessment of abilities in comparison with paper and pencil or apparatus tests is the possibility of presenting a moving stimulus and measuring the individual's ability to track it. This provides a measure of manual and finger dexterity and movement perception. The following provides examples of possible ways of measuring these aptitudes using readily available computer technology and response modes such as light pens, joy-sticks or rolling-balls.

A small circle appears on the screen. The examinee is asked to keep a light pen within the circle at all times while the circle makes random movements about the screen. The speed and direction of the circle may be varied. If the examinee finds the task of keeping the pen within the circle too difficult, then the speed of the circle may be slowed down. Alternatively, if the task is too simple, the speed may be increased to the point that shows the examinee's optimum ability. The computer measures the length of time that the pen is kept within the circle.

The same test can be administered using a joystick rather than a pen. The joystick is approximately three inches long and resembles a gearstick. As the circle moves randomly about the screen the examinee attempts to keep a mark, an **x**, for example, within it. The position of the **x** is controlled by the joystick. Pushing the joystick forward and back moves the **x** up and down on the screen. Pushing it left and right moves the **x** in the same direction.

A rolling ball can be substituted for the joystick. This device is like a small ball protruding from a plastic box. The part of the ball that is visible can be rolled by hand in any direction. As with the joystick, this controls the movement of the **x** while the examinee is attempting to keep it within the circle.

The same test can also be administered using two small rotating knobs, one to control the vertical, one the horizontal movement of the **x**.

In all of the above, the computer can be programmed to read and store the distance of the **x** from the target circle at different speeds and directions. Measurement, storage and analysis of results can be made immediately.

Tests such as these involve the presentation of moving objects on the screen. A further method of assessment dependent on this feature is where the examinee may be required to "pick up" an object and "deposit" it in another location. For example, a drawing of a simple machine may appear on the screen, together with a conveyor belt and, perhaps, a large container. The examinee would be required to use the machine to "pick up" an object from the container and place it on the conveyor belt. The object being moved may be static or mobile. These actions would be controlled by given keys on the keyboard. They could also be controlled by a joystick.

The test may consist of simple line drawings on the screen or may involve the use of colour, rotation of objects and other computer capabilities. The speed of the moving objects may be altered making the test either easier or more difficult as the need arises. A number of objects may be shown at many different times, with increasing fineness in their distinctions from one another. The examinee would be required to pick only those that are a certain shape, colour or size. The computer could be programmed to check the length of time a person has taken to pick up and deposit an object.

These computerized tests could be used to provide measures of fine motor coordination and finger dexterity. These aptitudes are particularly important in today's high technology environment, for example, in the manufacture of printed circuits.

2. *Assessment of Traditional Aptitudes Via the Computer*

The following provides some indication of the use of the computer to provide additional information in the aptitude areas assessed by paper and pencil tests.

Verbal Numerical Tests

The ability to extract relevant information rapidly from written material is a frequent requirement in business and industry. This could be measured efficiently with a computerized system. For example, one method may involve displaying a text of some kind on the screen — a narrative or a letter — which the examinee must read. A number of questions relating to the text appear at the bottom of the screen. The answers to these questions would involve the examinee's skill in categorizing the information that has been given, and isolating the exact problem expressed in the letter or in the narrative. The answer may be typed in on the alphanumeric keyboard or, if a list of possible-answers is presented, pointed at with a light pen.

Many variations are possible of this basic, simple method of testing verbal-numerical ability. The text may, for example, be removed from the screen when the questions are presented. The examinee may be told that the striking of some specific key on the alphanumeric keyboard will cause the text to return to the screen. As well as noting the answers, the computer may then record the number of times that the examinee has had to refer to the text and the length of time that the text was exposed. A similar method of presentation could be used to assess an individual's knowledge of grammar, punctuation, etc. A sentence or paragraph containing mistakes may be presented on the screen. The assigned task involves identifying the mistakes as quickly as possible.

Spatial-Perceptual Tests

Computer graphic capabilities provide the opportunity to measure these aptitudes easily and efficiently. Tasks requiring form perception and visual matching, similar to the Tool Matching task of the GATB, could be programmed in which the individual would be required to match a complex figure or pattern with one from a series of similar designs. The use of colour in the graphic display adds an additional dimension to this task.

Colour Vision

The use of colour in computer graphics also allows measurement of visual abilities not included in the GATB. A test of colour-blindness could be easily administered via a VDT, and provide information directly relevant to the use of computerized graphic displays now used in industry, where colour is used to highlight data presentation.

Motor Coordination-Dexterity Tests

The use of existing response modes such as the light pen, joystick, and rolling ball in the measurement of movement perception and dexterity required to track a moving stimulus has been outlined in the previous sections. These response modes may also be used to measure fine-motor coordination and dexterity.

One method of testing manual dexterity involves the use of a light pen. The computer is programmed to display a dot, at random, on the VDT for a specific period of time. Many variations are possible in this display, the dots may appear one at a time or together and they may be static or mobile. The light pen is used to touch as many of these dots as possible in a given period of time. Two pens, one in each hand, may also be used. The computer measures the number of "hits". The degree of accuracy could also be measured, e.g., 90% of the "hits" were within 1/10 of an inch of the target. The use of both the dominant and the non-dominant hand in tests of motor coordination provides valuable information in terms of an individual's neurological functioning. A comparison between the performance of the two hands can be made automatically by the computer.

Manual and finger dexterity could be tested by the following method. The computer would display an **x** and the examinee would be requested to reposition it by using a joystick or a rolling ball. Initially, the **x** is displayed within a circle. As another circle appears in a random spot on the screen the examinee is required to move the **x** into the new circle. The original circle, when empty, disappears. This procedure may be repeated several times, with a new circle appearing at any point on the screen once the examinee has manoeuvered the **x** into the given one.

The computer can be programmed to measure the speed with which the controls are adjusted in order that the **x** may be repositioned within the new circle. The number of moves that are made in a specific period of time and the length of time it takes to make a given number of moves can also be scored automatically.

A variation of the above procedure would use the alphanumeric keyboard. This has some potential to test finger dexterity. A set of four keys are chosen from the keyboard e.g., I, J, K and M. The J and K are beside each other on the keyboard, the J on the left and K on the right. The I is above the J and K and the M is below them. Again, the aim is to reposition a marker that appears on the screen. This marker may be an X or an other letter, number or shape. Striking the K will cause the marker to move towards the right. The I key is responsible for the upward movement of the marker and the M key for the downward movement. Both hands, either separately or together, may be used in this procedure.

Rotating knobs may also be used in testing finger dexterity and fine motor coordination. Twisting the knobs involves using the fingers quickly and efficiently. Again movement of a marker on the screen may be measured with one knob controlling movement in a horizontal plane and the second in a vertical plane.

Tasks such as described above provide a measure of the individual's ability to make certain judgements regarding the movement of objects and their interrelationships, combined with the ability to coordinate hand and eye movements efficiently.

These skills are frequently required in situations where an operator must control equipment that serves as an extension of human arms.

One example of this type of operation is the operation of a mechanical arm to manipulate objects in space. An excellent example is the "Canadarm" used in the U.S. space program. The control of this arm results from the use of certain knobs and switches rather than physical strength. Another example is in the handling of dangerous materials, perhaps those which are radioactive.

General Learning Ability

Computer graphics may also be used to measure general learning ability using spatial rather than verbal materials. This can provide valuable information on the learning skills of someone who is not able to complete traditional verbal tests for a variety of reasons, such as, the language difficulties experienced by a recent immigrant who has not yet learned English.

One method of doing this would be to display a series of objects on the screen. The examinee may then be asked to do some type of classification of objects on the screen. The choice of items may be dependent on their shape, their colour or their relationship to another object. The examinee selects the correct choice based on a particular abstract principle.

Chapter 5

Automated Adaptive Assessment

Adaptive Testing

Adaptive testing is one of a number of terms used to describe a procedure in which the test items administered to an individual are based on his previous performance in the test. Other terms used to describe this method include tailored testing, branching testing, programmed testing and individualized testing. The term adaptive is used because these tests adapt themselves to the examinee. This type of testing requires the availability of a large pool of items, whose item statistics are known from which appropriate items can be drawn (Hambleton, Swaminathon, Cook, Eignor and Gifford, 1978). For example, if an examinee received an initial test item of average difficulty, the correct answer would cause the selection of an item of greater difficulty, whereas an incorrect answer would cause an easier item to appear. This procedure results in better discrimination at any level of ability and avoids administering many easy items to bright individuals or many hard items to the less able person. This point is demonstrated graphically in Figure 1. One advantage of adaptive testing is that 50 to 80 percent fewer total test items are required to achieve the psychometric precision of a conventional test. Other characteristics of adaptive tests include higher reliability and better validity (Weiss, 1977, Pine and Weiss, 1978). The development of adaptive tests is arduous because the psychometric property of a large number of items in each aptitude area has to be created. In scoring the test, instead of the traditional number of correct scores a statistical combination of how many items, the difficulty of the item, and the pattern of right and wrong responses is used.

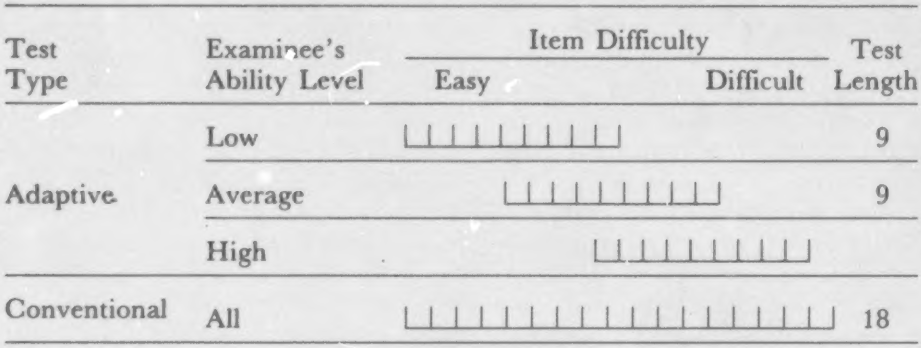
Modern computers have played a significant role in enabling more accurate individualized tests to be devised and administered. Computers can, if effectively used, assist in the efficient channeling of clients towards occupations that will make optimum use of their skills.

Current Uses of Adaptive Vocational Testing

A large scale project to computerize the testing of vocational aptitudes is currently being conducted by the U.S. Navy in conjunction with the Air Force and Army (Wiskoff, 1981). This project is to develop an automated system of administration of the Armed Services Vocational Aptitude Battery (ASVAB) using adaptive testing procedures. The research and development plans included five aspects: 1) development of an item bank, 2) development of prototype psychometric methodology, 3) assessment of the requirements for an automated adaptive testing delivery system, 4) system development and evalua-

Figure 1

Utilization of test items in adaptive and conventional testing



tion, and 5) system implementation. The goal is to have the system operational by 1985 and large contracts have been awarded for its development.

The aptitudes measured by the ASVAB include: General Science, Arithmetic Reasoning, Work Knowledge, Paragraph Comprehension, Numerical Operations, Coding Speed, Auto and Shop Information, Mathematics Knowledge, Medical Comprehension and Electronics Information. These aptitudes overlap with those measured by the GATB and the test has extensive normative data as a result of the 800,000 people enlisting in the U.S. armed services per year. The conversion of the test to a computerized adaptive mode will constitute an updating of questions that are relevant to modern occupational requirements. The Canadian Armed Forces (AFPARU) Personnel Applied Research Unit is developing a modern version of the U.S. Army Classification Battery entitled the Classification Battery Men Experimental (CBM-X) (Ellis and Saudino, 1980; Saudino and Ellis, 1981). Currently work on CBM-X is focused on evaluation of predictive and concurrent validity. The AFPARU has no immediate plans to develop computerized adaptive testing procedures.

Latency

One of the distinct advantages in using the computer to do automated testing is the ease and accuracy of acquiring response time or latency scores. That is, the time interval between the stimulus and the person's response. Interest in latency and its relationship to other behaviours in a testing situation was in evidence over one hundred years ago. Willheim Wundt conducted much of the early work in experiments on the speed of decision-making. Beginning with Henman (1911), confidence rating came to be intertwined with response latency and accuracy. A considerable number of studies have investigated these variables and the relationship is complex. In general, latency is shortest with easy items and increases with the complexity of the problem, and lessening confidence within the person (Reasbeck, 1976; Petrusic and Jamieson, 1978; and Anuza, 1981). The difficulty of an item can be calculated from the latency and accuracy scores in order to rank the items from easy to hard, or to generate items of similar difficulty.

In an automated version of the GATB latency scores for all items should be recorded for later analysis. They could be used to examine variables such as: 1) item difficulty; 2) determination of items that are good versus poor discriminators with respect to cut off scores; 3) indications of especially slow or fast responders in order to identify retarded or especially talented individuals; and 4) assessment of individuals who guess or are responding randomly. Determination of the utility of the latency scores could occur only after the assessment of a sample of persons taking the automated version of the test. This could be included in the original pilot study determining reliability and validity.

Chapter 6

Procedures for Computer Administration of the GATB

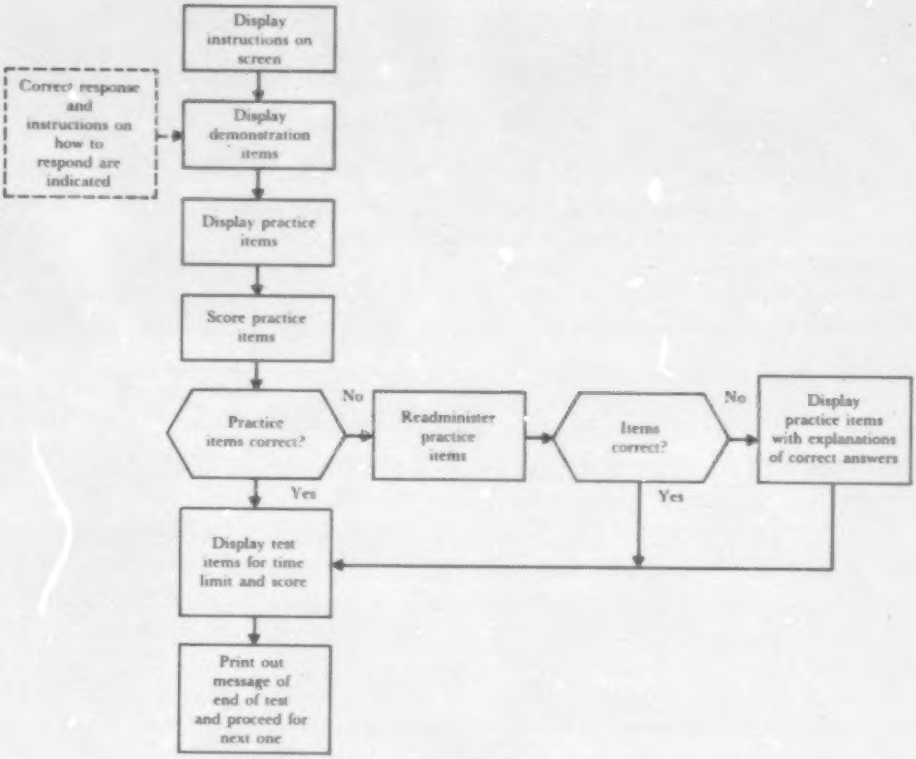
This chapter illustrates the procedures that would be carried out in an automated testing session of the GATB. Examples of specific instructions for each Part are described. As is the case in the manual version of the GATB a grade six reading level is required. Details of the actual hardware necessary for the implementation of the automated version will be discussed in Chapter 7. The general sequence of administration of the automated tests is illustrated in Flowchart 1. The first tests will be presented in considerable detail to provide examples of these procedures.

After the client has been seated in front of the Video Display Terminal (VDT), and has pressed a start button, the test sequence is automatically initiated. First, the instructions to put the examinee at ease appears on the screen (as in the GATB Manual, Section 1 p. 11) with additional comments on computerized assessment procedures.

The examinee is allowed to read these instructions at his own rate and at the bottom of each screen full are instructions on how to proceed further, e.g. "Press key labelled "CONTINUE" to proceed". Following these instructions, the examinee will be asked whether he has any difficulty following the procedures, and, if so, instructed to consult the test administrator.

Flowchart 1

Sequence of automated test administration


Display instructions on screen
Correct response and instructions on how to respond are indicated
Display demonstration items
Display practice items
Score practice items
Practice items correct?
No
Readminister practice items
Items correct?
No
Display practice items with explanations of correct answers
Yes
Yes
Display test items for time limit and score
Print out message of end of test and proceed for next one

Personal Data Information

The examinee is instructed to type in his own name, age, social insurance number and educational level. In addition, he is asked whether he normally wears spectacles and whether he is in a normal state of health. If he has forgotten his spectacles or is suffering from some ailment, he will be advised to terminate the testing session and arrange another appointment with the test administrator.

Part 1. Name Comparison

The practice items appear on the screen as presented in the GATB Book 1 with the accompanying explanation of the nature of the task.

The first practice item appears with the letter "S" at the right-hand side of the screen, and the second practice item with the letter "D". An explanation that the letter "S" is used to indicate that the two names are exactly the same, and the letter "D" to indicate that the names are different is printed below the practice exercise, and the examinee instructed to press the keys marked "S" and "D" in the following practice items in order to indicate his response. The letter selected will appear on the right hand of the screen of the key in line with the question item following depression of the key.

Six practice items are presented as in Book 1 and automatically scored by the computer. If the examinee makes an error on a particular practice item, that item is presented again with instructions to look more carefully. If he continues to make an error the correct answer is displayed by the computer with an explanation. Instructions are then presented that he must now answer more exercises like these and that he will have six minutes to answer as many as possible. Subsequently the 150 test items are presented in units of 10 items until the time limit is reached. After each five items have been answered the lower set of five items are raised up the screen and the following five displayed.

The following Diagram 1 is an illustration of the appearance of the screen after the examinee has responded to item no. 44. The names used in this diagram are not exactly those used in the GATB, but are used to provide examples. An automated version of the GATB would use actual items from the original GATB.

Diagram 1

Illustration of VDT presentation of
Part 1: Name Comparison

41. Can. Wood Ass'n	— Can. Wood Ass'n	S
42. B.F. Fergusen	— B. F.ergusen	D
43. Roy Barber Garage	— Ray Barber Garage	D
44. Colter's Pharmacy	— Colter's Pharmacy	S
45. Longsbottom Inc.	— Longsbottom Inc.	
46. Copeland Supply	— Copeland Supply	
47. Bellwood Court	— Ballwood Court	
48. D.C. Sothovone	— D.C Sothovone	
49. Wassel Bros. Agency	— Wassle Bros. Agency	

The computer presents the test items for 6 minutes, following which the items are removed from the screen, and a message is printed out informing the examinee that this is the end of this section and to press "CONTINUE" to proceed to the next section.

Part 2. Computation

The same general procedure is followed in this subtest as has been outlined in the previous description. Scratch paper and a pencil must also be provided. The demonstration items (Practice items 1 and 2) are presented with the multiple choice answers (A, B, C, D & E) alongside the question. The correct response is indicated by underlining the appropriate letter, and the examinee is instructed to respond by pressing one of these letters on the keyboard. The remaining practice items are displayed and following the examinee's response the selected letter is underlined. Again errors on practice items are scored with repeat presentations and explanations. Instructions on how to proceed and the time limit allowed are presented.

The test items are then displayed in units of two items. Diagram 2 illustrates the appearance of the screen following the examinee's response to an example of no. 18.

Diagram 2

Illustration of VDT presentation of
Part 2: Computation

18. Divide (÷)	A 44 B 46
$7\overline{)336}$	C 48
	D 56 E none of these
19. Subtract (−)	A 6379 B 6299
$\begin{array}{r}6406\\ \underline{15}\end{array}$	C 6388 D 6399 E none of these

Following the allowed time limit of six minutes the test items are removed from the display and a message indicating the end of the section and how to proceed to the next section is displayed.

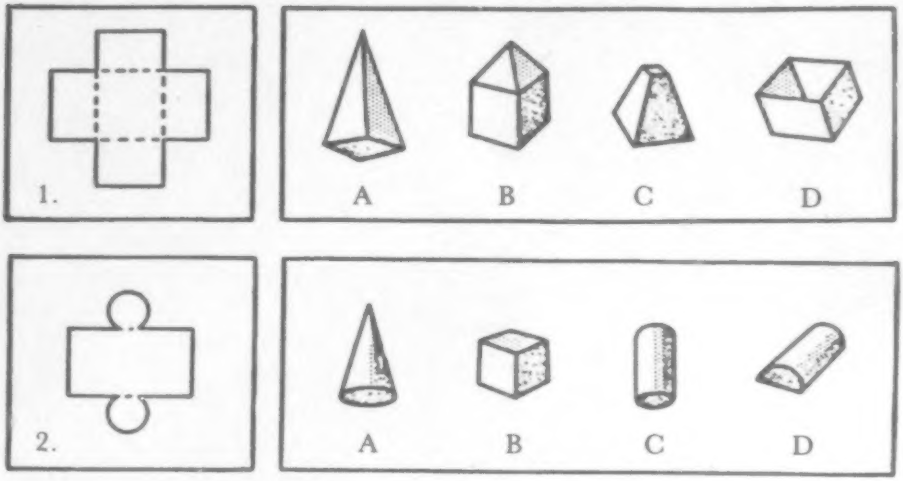
Part 3. Three-dimensional Space

The instructions, demonstration and practice items are displayed on the VDT in a similar format to the previous sections. In this test the examinee responds by pressing a key A, B, C or D. As in the previous test two items will be presented on the screen simultaneously, and following depression of the selected key the appropriate letter will be underlined. This subtest requires special graphic capabilities which will be discussed in Chapter 7. Diagram 3 provides an illustration of the VDT presentation of the demonstration exercises numbers 1 and 2.

The display of the test items, the time allowed (6 mins.), and the instructions at the end of the test are as discussed in the previous sections.

Diagram 3

Illustration of VDT presentation of
Part 3: Three-Dimensional Space



Part 4. Vocabulary

Presentation of this subtest is essentially similar to that described for Part 2 with instructions, demonstration and practice exercises. The response required for the examinee in this part is to press two buttons indicating which word pairs have either the same meaning or opposite meanings. Again the letters selected will be indicated on the screen by underlining the appropriate letters. Diagram 4 illustrates an example of this procedure. The test items are displayed for a time limit of six minutes, following which the examinee is provided with instructions that this is the end of the section and how to proceed to the next section. Items are presented in groups of 10 at a time, following completion of the first five items the second five items are moved to the top of the screen and the subsequent five items presented below.

There could be an option for a five minute rest period as indicated in the manual, following this subtest.

Diagram 4

Illustration of VDT presentation of
Part 4: Vocabulary

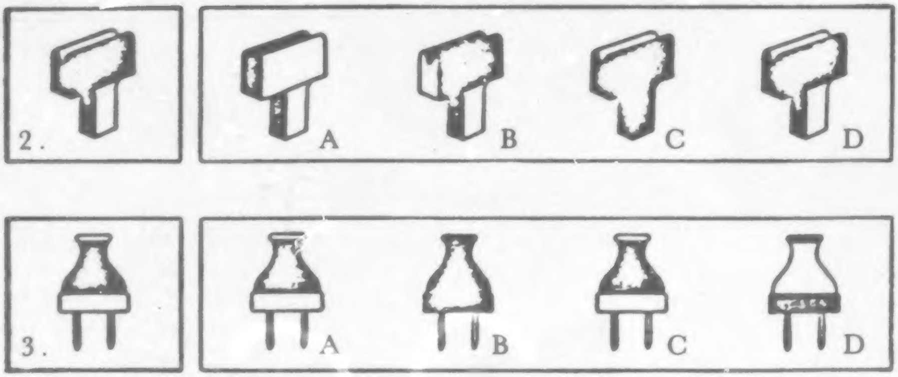
6.	a. tired	b̲. happy	c. awake	d̲. sad
7.	a̲. funny	b. refreshing	c. diverting	d̲. comic
8.	a̲. tragic	b. traffic	c̲. traumatic	d. tremendous
9.	a̲. report	b̲. narrate	c. frequent	d. thrill
10.	a. ask	b. tell	c̲. order	d̲. command
11.	a. cruel	b. dashing	c. modest	d. kind
12.	a. loose	b. bulky	c. slack	d. fit
13.	a. glitter	b. compact	c. shine	d. flash
14.	a. tariff	b. outcome	c. income	d. abstract

Part 5. Tool Matching

The display of the instructions, demonstration, practice and test items is similar to that described for the three-dimensional space test. Once again the specific graphic capabilities will be discussed in Chapter 7, and the selection of a response is indicated by underlining the appropriate letter. Time limits and instructional messages are as indicated in previous sections. Diagram 5 provides an illustration of the VDT display of this part.

Diagram 5

Illustration of VDT presentation of
Part 5: Tool Matching



Part 6: Arithmetic Reasoning

Presentation is essentially similar to that of Part 2 Computation, although as in the manual version the multiple choice alternatives are presented below the question. Again scratch paper and a pencil are required. Once more depression of selected letter key is indicated by underlining the appropriate letter on the screen. The time allowed, in this case, is seven minutes. Diagram 6 illustrates an example of the automated version of this subtest.

Diagram 6

Illustration of VDT presentation of
Part 6: Arithmetic Reason

14. Bill has 1/5 as much money as Frank. Frank has $7.00. How much money has Bill?
    - a. $1.30
    - b. $1.40
    - c. $1.45
    - d. $1.50
    - e. none of these

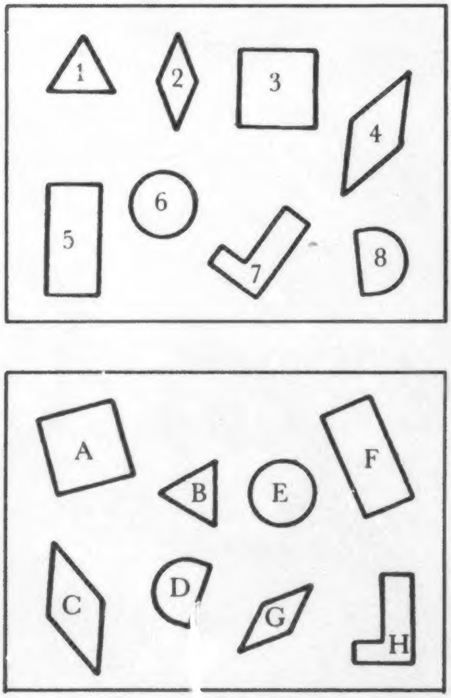
15. A man earns $275 per week. Tax is withheld at the rate of 26 percent. How much tax does he pay per week?
    - a. $ 26.00
    - b. $203.50
    - c. $ 70.25
    - d. $ 71.50
    - e. none of these

Part 7: Form Matching

Instructions, demonstration and practice items are presented as described in Part 5: Tool Matching. In this test, the examinee must press two keys, one representing a number and the second a letter indicating a matching shape. No information regarding the shapes already identified is given to the examinee in order to replicate as accurately as possible the manual version of the test. Diagram 7 illustrates this procedure. Time limits (six minutes) and instructions at the end of the test are as indicated in previous sections, except the examinee would have the option of a fifteen minute break before proceeding to Part 8 and the apparatus sections of the test.

Diagram 7

Illustration of VDT presentation of
Part 7: Form Matching

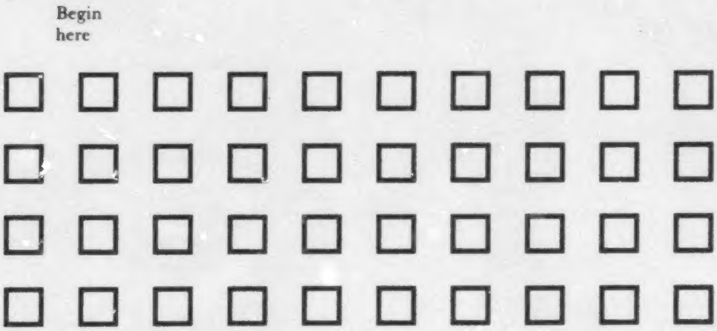


Part 8: Mark Making

The instructions for this test are again displayed on the VDT. The examinee is provided with a special pen and a graphics, or digitizing tablet (more details of the hardware requirements and possible alternatives will be discussed in Chapter 7). After he has read these instructions and pressed a button to continue, a practice session of 10 seconds is allowed in which the examinee makes the same three marks |_| in a series of squares on the graphic tablet as in the original version. Diagram 8 provides an illustration of this procedure. Following this practice session, instructions are again displayed on the screen to encourage the examinee to go faster this time, and a second practice session of 10 seconds is allowed. Instructions for the test sessions and the time limit of 60 seconds are then presented and the examinee timed for this period. The timing would be initiated by the first mark the examinee makes on the graphics tablet.

Diagram 8

Illustration of VDT presentation of
Part 8: Mark Making

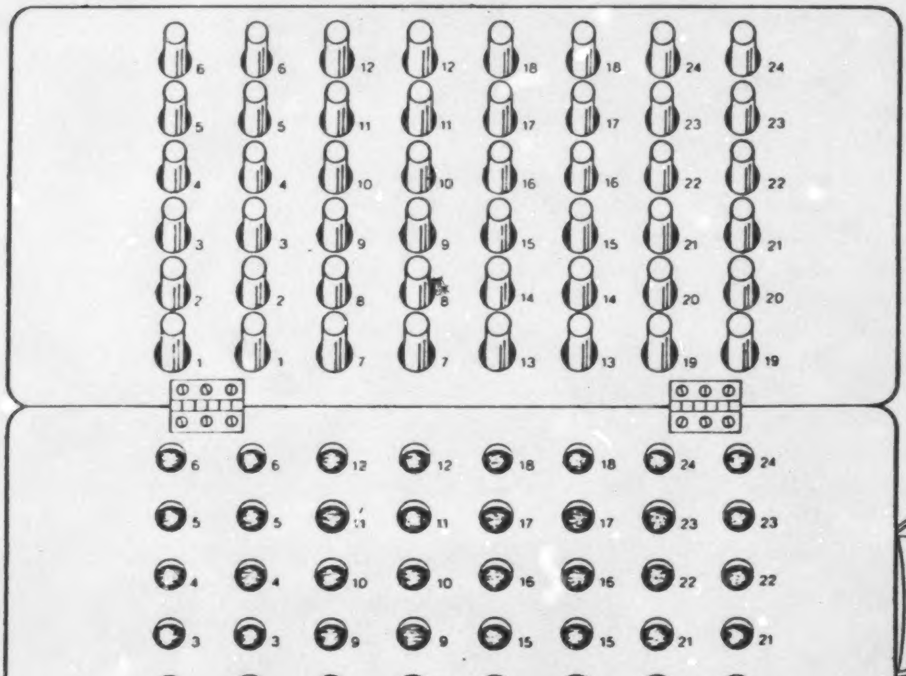


Part 9: Place

A specialized unit connected with the computer system will have to be built for this subtest which replicates as accurately as possible the manual version. The pegboard is wired directly to the computer but can be rotated 180 degrees in a horizontal plane. The possible methods of hardware implementation will again be discussed in Chapter 7. Diagram 9 illustrates the type of pegboard used in this test.

Diagram 9

Manual Dexterity Board Set-up for
Part 9: Place


6 6 12 12 18 18 24 24
5 5 11 11 17 17 23 23
4 4 10 10 16 16 22 22
3 3 9 9 15 15 21 21
2 2 8 8 14 14 20 20
1 1 7 7 13 13 19 19
6 6 12 12 18 18 24 24
5 5 11 11 17 17 23 23
4 4 10 10 16 16 22 22
3 3 9 9 15 15 21 21
2 2 8 8 14 14 20 20
1 1 7 7 13 13 19 19

(Examinee stands here)

Prior to the administration of this test and the following three tests the examinee is asked, via the VDT screen, whether he is right or left-handed and told to press a key indicating his choice. Instructions are then given only for the handedness selected. The examinee is also instructed to stand for Parts 9 and 10.

One of the hardware alternatives to be discussed is the use of a video disk, this option would allow a video demonstration of the task required. If this option is not selected it would not be possible to give any demonstrations and only instructions and practice items would precede actual timed testing.

Instructions are displayed on the screen as in the original version with the same specific details, e.g. to proceed with the test if a peg is dropped. A timed practice trial is then allowed and the computer which senses the presence or absence of a peg in a hole, scores the number of pegs removed from the top half of the pegboard. If the examinee has removed the pegs in the wrong order or placed them in the wrong positions in the bottom half of the pegboard, a message is printed on the screen with more detailed explanations and instructions.

The examinee is then instructed to place all the pegs in the bottom half of the pegboard (including any which he may have dropped). The computer automatically checks that all pegs are in place in this section. An instruction is then displayed on the VDT to rotate the board so that the section containing the pegs is now at the top, and the computer checks that this has been done and that all the pegs are in place.

Instructions for the timed trial are now displayed and the computer allows a 15 second time period following removal of the first peg. After fifteen seconds the number of pegs removed from the top section is recorded automatically, a buzzer is sounded, and a message displayed informing the examinee that the time limit has expired and instructing him to place the rest of the pegs in the bottom half of the board. The procedure of checking, rotating the board and allowing a timed trial of fifteen seconds is repeated, for a second and third timed trial. In each case the computer checks that all the pegs are in the correct position before allowing a valid trial.

Part 10: Turn

The computer checks that all pegs are in position in the lower half of the pegboard, and, if not, displays a message instructing the examinee to position them. Instructions are then presented on the VDT on how to turn the pegs and the sequential order in which this must be done. The automatic pegboard and pegs will be designed with the capacity to sense the orientation of the peg in the hole.

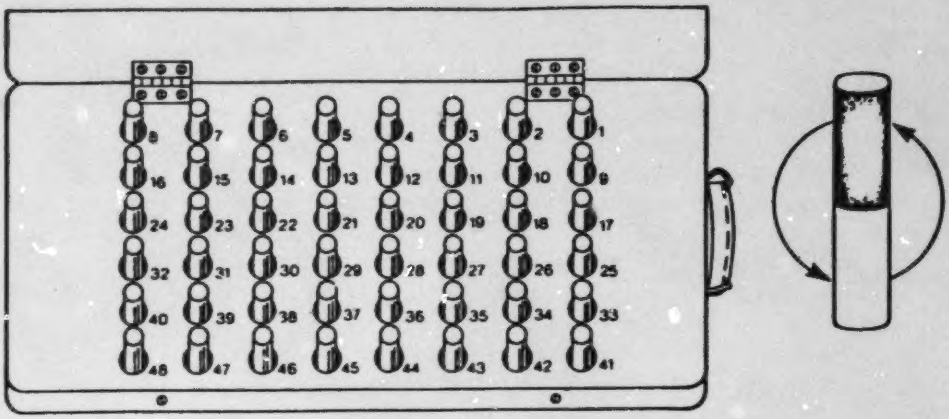
Again a demonstration of the test could be given via video disk if this hardware option is selected.

A practice trial is then given and the computer checks to ensure that all the pegs have been turned and that the correct order has been followed. Diagram 10 illustrates the board used in Turn.

Instructions for the timed trial are displayed and the timing is again initiated by the removal of the first peg. After the 30 second time limit a buzzer is sounded to indicate the end of the time period, and the computer will score the number of pegs turned and display a message informing the examinee that the first trial is over and to turn the remaining pegs over in preparation for the next trial. A buzzer is used to indicate the end of the time period. This procedure is repeated for the second and third timed trials. Following the third timed trial the examinee is instructed to sit down in preparation for the next exercise.

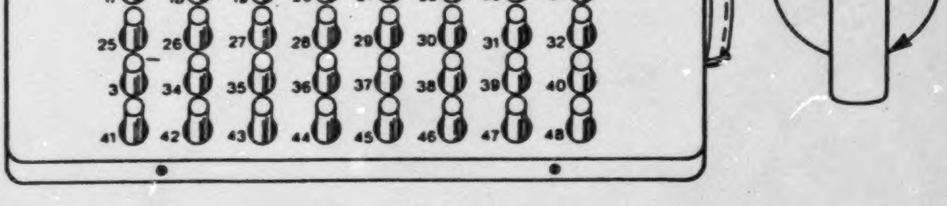
Diagram 10: Turn

For Right-Handed Examinees


8 7 6 5 4 3 2 1
16 15 14 13 12 11 10 9
24 23 22 21 20 19 18 17
32 31 30 29 28 27 26 25
40 39 38 37 36 35 34 33
48 47 46 45 44 43 42 41

(Examinee stands here)

For Left-Handed Examinees


1 2 3 4 5 6 7 8
9 10 11 12 13 14 15 16
17 18 19 20 21 22 23 24
25 26 27 28 29 30 31 32
33 34 35 36 37 38 39 40
41 42 43 44 45 46 47 48

Part 11: Assemble and Part 12: Disassemble

A specially designed unit will be necessary to allow automation of this test with the capability of sensing the presence or absence of a rivet in a hole. The hardware options are discussed in Chapter 7. Diagram 11 illustrates the type of finger dexterity board required for Parts 11 and 12.

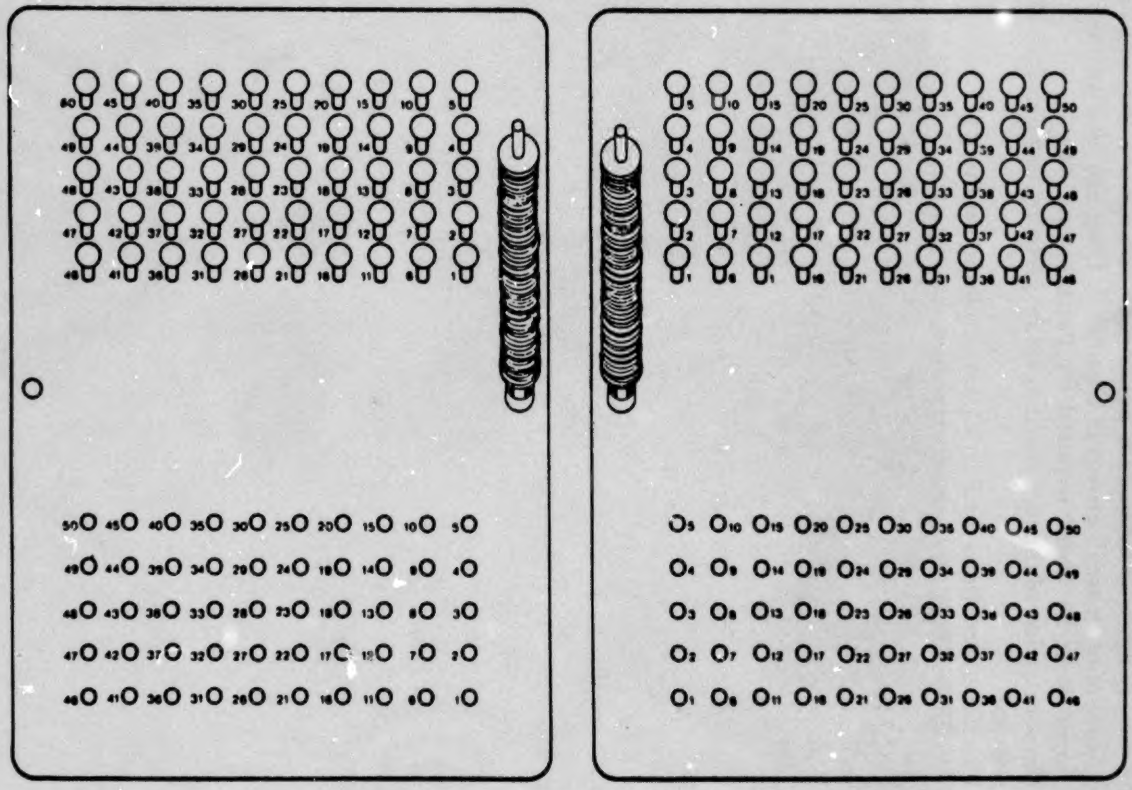
Demonstration of the task could again be given by video disk if this option is selected.

Practice instructions for Part 11 are displayed on the VDT with the specifics as outlined in the manual regarding the sequence of rivets which must be assembled and which hand to use to take the washers from the rod, as well as which hand to use to place the assembled unit in the hole. The computer scores Part 11 on the basis of number of rivets removed from the top section of the board according to the scoring criteria indicated in the manual. After the examinee has placed assembled units in the first five columns of the lower section of the board, a buzzer is sounded and instructions are displayed for the Disassemble task as described in the manual. The assembled units are then disassembled, and the computer checks that the rivets have been replaced in the correct sequence in the top half of the board and the washers replaced on the rod. Instructions for the timed trial for Part 11 are then displayed and the timing of 90 seconds initiated by the removal of the first rivet. A buzzer sounds at the end of this period and a message displayed informs the examinee that this is the end of the timed trial and to complete the rest of the board. The computer checks that the lower section has been completed and displays instructions for the timed trial of Disassemble. The timing of 60 seconds is initiated by removal of the first rivet from the lower part of the board and a buzzer is sounded at the end of the time limit. The computer scores Part 12 on the basis of the number of rivets removed from the lower part of the board according to the scoring criteria indicated in the manual. Instructions are displayed to move the remaining rivets to the upper part of the board and replace the remaining washers on the rod, the examinee is thanked for his cooperation and informed of the next step in the counselling process.

Diagram 11: Assemble

For Left-Handed Examinees

For Right-Handed Examinees



(Examinee sits here.)

(Examinee sits here.)

Chapter 7

Hardware and Software Applications to GATB

Verbal and Arithmetic Tests (Parts 1, 2, 4, 6)

In general, these verbal and computational tests can be presented on a standard Video Display Terminal (VDT). The format for the presentation of both the instructions and the questions has been outlined in Chapter 6.

In order to record the examinee's response a standard keyboard is required. Several modifications could be easily introduced to simplify this response mode. For example:

1. The name of the "Return" key could be changed to "Continue".
2. Keys could be relabelled so that the letters ABCDE are aligned in the centre of the second row of the keyboard.
3. A plexiglass cover could be designed which exposes only the keys required for responses.

An alternative technology to the keyboard for recording an examinee's response would be the use of a light pen, in which the examinee touches his selected response on the screen.

Any standard microcomputer has the capability of presenting the material, recording the responses and analyzing the results. In order to provide an accurate as possible replication of the GATB, a black and white console, rather than colour, is sufficient.

Comment

The advantages of the light pen compared to the keyboard include less search time and ready acceptance by many people. The disadvantages are that more software is required and light pens have been reported to be less durable and less reliable.

The standard keyboard offers several advantages including low cost, durability and reliability. Although there is some search time involved, as with the multiple choice answer sheet, it is unlikely to affect the scores significantly.

Spatial and Perceptual Tests (Parts 3, 5, 7)

These tests require high resolution graphics in order to replicate exactly the detail of the original stimulus material and to ensure the validity of the automated version.

The forms could be digitized and the graphics displayed on a high resolution screen. The method of digitizing the graphics most efficiently would have to be determined by a computer systems specialist.

An alternative method of displaying these spatial tests is with a video disk. This method could be used to not only display this graphic information but would permit the use of its audio capabilities. Both the instructions for the test and a video demonstration could be produced using this system. Video disk technology could be interfaced with a microcomputer system.

Comment

There may be some difference in the degree of resolution offered by either of these alternative technologies as compared to the Book version. However, it is considered that these techniques would allow a sufficiently close approximation of the Book version to provide a valid alternative method.

Motor Coordination (Part 8)

In order to replicate most reliably the Mark Making test it would not be possible to use peripheral equipment such as a joystick or a roller ball. Feasible alternatives include a touch-sensitive screen, a light pen or grahics board. Both the light pen and the touch sensitive screen are normally used in a vertical plane. Although it is possible to design a horizontal mounting, for these options, the use of a graphics board, or digitizing tablet, and a special pen interfaced with the computer would allow the most accurate replication of the paper-and-pencil test of Mark Making. Commercially available graphics boards such as the Apple Graphics Tablet System have a resolution of approximately 1/16 of an inch which would be sufficient to sense the making of three distinct lines as is required in the paper and pencil version.

Comment

1. One of the disadvantages of this method is a reportedly high failure rate of the graphics board. This may be a serious consideration in view of the fact that the system may be subject to heavy use and the tablets could be broken easily.

2. A difficulty which could be encountered in this automated version of the test arises in evaluation of the results. If the computer is programmed to score only squares with the correct number and location of lines in the required orientation, e.g. $\underline{|}|$, this could lead to a different score than manual administration and scoring where a count may simply be made of the number of squares filled.

3. This test would require two templates, one for the practice trials and one for the test itself since the location of the squares to be marked differs in the practice trials compared to the test trial. As a result, the graphics tablet would have to be modified to ensure that the template would be aligned correctly.

This alignment would be quite critical, and difficult for an inexperienced examinee.

Manual Dexterity (Parts 9, 10)

In order to automate this test, specialized hardware and software would be necessary. No available commercial product could be used to replicate this test and modifications of the current pegboard would be necessary. A new product would have to be developed with the capability of 1) sensing the presence of a peg in a hole 2) sensing the sequence of pegs placed in the holes and 3) sensing which end of the peg is in the hole.

These requirements are technically possible through the use of light, pressure or inductive sensors.

Comment

1. The cost of development of the hardware required for an automated pegboard and the software needed to interface with the microcomputer will be high. This is discussed further in a separate section.

2. A problem which arises in the automation of this task is in the monitoring of the examinee's performance on both the practice and the timed trials. The score is based solely on the number of pegs removed from the top half of the board, this could be easily sensed by the computer.

However, since errors are not penalized or noted in any way in the manual form, it may be virtually impossible to ensure that the standardized procedures are followed. If scoring included a measure of the correct placement of the pegs in the lower half of the board, this could be programmed in the computer; however the instructions specifically state a person can drop pegs and, in fact, this is demonstrated in the manual version. For example, it would be possible for a variety of reasons, ranging from being "test-wise" to careless, to simply drop all the pegs on the floor and achieve a high score on this task. This difficulty could be encountered in both Part 9 and Part 10.

3. A substantial design problem with respect to the pegboard is a method of allowing the pegboard to be rotated 180 degrees without interfering with a connecting wire or the sensory mechanisms.

4. Minor modifications in the pegboard have been shown to influence substantially the score obtained. For example, research has been conducted to compare performance on wooden versus plastic pegboards (Trimmer & Klein, 1974). These authors, in a review of eight studies, report an average difference of approximately 10 points in favour of the wooden apparatus. These findings raise two important issues with respect to an automated version of the pegboard. Firstly, it may be virtually impossible to design a sensory mech-

anism for a wooden peg. Secondly, any modifications of the current apparatus would probably require a re-evaluation of the normative data.

5. The instructions for these tasks require that the examinee be standing. Unless there was some detector on the floor or the seat, there would be no way of determining whether or not the examinee actually was doing this. Failure to follow the standardized procedures would invalidate the examinee's results, and prohibit use of the current normative data.

Finger Dexterity (Parts 11, 12)

Once again a completely new product would be necessary to provide a valid automated version of this test, with the capability of sensing the presence or absence of a rivet in the board in the correct sequence. The technology required is essentially similar to that required for Parts 9 and 10.

Chapter 8

Feasibility of an Automated GATB

There are a number of issues to be considered in the automation of the GATB. These include the problems of design of the appropriate hardware and software required as well as problems associated with whether an automated version could be developed which would allow reliable and valid use of the existing normative data.

In reviewing the nature of the tasks required, it is apparent that the twelve tests fall into two distinct categories: First, those which are readily automated and do not require the development of specialized equipment, Parts 1 to 7, and, second, those which require special apparatus, Parts 8 to 12. Although equipment could be designed to successfully automate and score Parts 8 to 12, the standardized procedures essential to the test administrations cannot be adequately monitored in an automated version. For example, whether the person is standing for Parts 9 and 10 and sitting for Parts 11 and 12, or following the exact method of sliding the washers to the bottom of the board in Part 12.

An Available Automated GATB

In support of the above conclusions regarding the feasibility of automating only Parts 1 to 7 of the GATB, the same conclusion has been reached by researchers in the United States. The company of Bolt, Berenek and Newman in Cambridge, Massachussets, has developed an automated version of the first seven parts of the GATB. This is a special purpose micro-based system with digitized graphics on a high resolution screen. The unit is portable and approximately the size of a typewriter. This system includes the use of a light pen to indicate the examinee's response on the VDT, such that when the examinee selects his response, an **x** appears on the screen under the light pen or the target item turns black. Results of the individual's aptitude profile as indicated on the automated GATB are related automatically with the results on an Interest Inventory (USES Interest Checklist). This company reports a 30% reduction in labour and a cost effectiveness of 8:1 in favour of the automated administration of the GATB over the manual version. The company is presently evaluating the similarity of scores on the automated and manual versions.

Cost

The cost of development of an automated GATB is dependent on whether only Parts 1 to 7 are to be automated or the entire test. Specific cost estimates are also dependent on the system chosen, e.g. video disk versus digitized graphics, and should be made by specialists in computer systems. Preliminary estimates of an automated version of the entire test range from $50,000 to $100,000 for software development and $40,000 to $50,000 for the development of the hardware. Subsequent units are estimated to cost between $9,000 and $12,000. If only Parts 1 to 7 are automated, these costs would be reduced by 1/3 to 1/2 of the total cost. These figures must be considered as general guidelines and could be higher or lower as a function of unforeseen development problems or technological advances. The unit developed by Bolt, Berenek and Newman has been quoted as $15,000 U.S. for one unit, although their goal is to reduce this cost to $3,000 - $4,000 per unit with increased production.

Standardization of the Automated GATB

Of primary concern in an automated version of the GATB would be the similarity of scores obtained in the computerized and manually administered versions. Previous research in this area has shown a high degree of concordance between automated and paper and pencil versions of tests (Elwood, 1972; Guarnaccia et al, 1975, Tapley & Bryden, 1977, and Cory et al. 1977). It would be necessary however, to establish this concordance. This would be crucial if the decision is made to automate the motor coordination and dexterity tests.

An evaluation on the similarity of the two versions does not require extremely large studies of complex design. The principal evaluation study would require a random sample of individuals taking the GATB, to take it twice in a crossover experimental design. That is, one half of the sample would be tested with the automated version first and the manual version second, while the other half would take the manual version first. The alternate Forms A and B of the GATB could be used in this reliability study. An approximate estimate of the study size is a total of 200 subjects to be tested twice in a six week period. Correlation and concordance statistics of the raw scores and latency scores would be used to determine the concurrent reliability.

A second study to evaluate the concordance of the two versions of the GATB test could include a sample of preselected skilled (high scorers) and unskilled (low scorers) employees in a specific occupation to re-take the test in the automated version in order to determine predictive validity.

Chapter 9

Conclusions

In general, it is feasible to automate Parts 1 to 7 of the GATB. It is anticipated that an automated version would replicate the manual version and that no significant differences in scores would be found. This would permit use of the current norms. The only major considerations in the development of these automated tests would be the requirement of high resolution graphics. Two alternative technologies have been discussed in this proposal, video disk and digitized graphics. The video disk has the advantage of audio capabilities which would permit voice instruction as well as allow a visual demonstration on the screen.

It is not considered feasible to automate the apparatus tests, Parts 8 to 12. Although systems could be developed to modify the apparatus for adequate scoring, the normal monitoring of the examinee by the test administrator necessary for a standardized procedure is virtually impossible.

An issue which must be considered in evaluating the relative advantages or disadvantages of an automated version of the GATB is the role of the test administrator. Qualified personnel will still be required to be on hand during an automated assessment, altough the time required for actual administration will be reduced by approximately 80%. This would require careful planning for the efficient use of the administrator's time. Presently the test is normally administered in a group situation of five to ten people. This consideration should be weighed against the saving in administration time using automated procedures. If a large number of automated units are used, this would lead to a substantial decrease in the overall costs of test administration.

Recommendations

The most desirable method of automating aptitude assessment would be the development of a completely new battery of tests which would take advantage of the unique capabilities of the computer, such as the display of moving stimuli, and the use of adaptive testing procedures. This would be a long term and expensive project which would include the collection of new normative data. The cost of such a program might be prohibitive. An alternative to this option would be to wait for the completion of the U.S. Computerized Adaptive Testing based on the Armed Services Vocational Aptitude Battery. To date there is no indication that the USTES is planning to revise or update the GATB. In view of these considerations the following recommendations are appropriate. These recommendations are based on the assumption that the GATB will continue to be used at current levels.

1. An automated version of Parts 1 to 7 of the GATB developed by Bolt, Berenek and Newman should be purchased and/or carefully reviewed to evaluate its adequacy as an alternative to the manual version.

2. If this option is not deemed appropriate, estimates of development costs for both hardware and software should be obtained from specialists in the research and development of computer systems. This would include the preferred technological method of implementation as well as the choice of commercially available microcomputer or the development of a specialized dedicated computer unit.

3. If these cost estimates fall within acceptable limits, two or three prototypes should be developed and evaluated. The evaluations would require a reliability study comparing performance on the paper and pencil and automated versions of the test similar to that outlined in the preceding Chapter.

4. If an automated version of the GATB is proved feasible, test scores should be integrated with results from occupational interest inventories, such as CHOICES, and the Canadian Classification and Dictionary of Occupations in order to facilitate the counselling process.

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An Evaluation of Certification in Testing Preliminary Study[*]

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Preface

In September '81, I enrolled at the University of Montreal with a view to completing a Master's Degree in Education, majoring in Measurement and Evaluation. In order to get this degree my studies had to include two practical periods in Measurement and Evaluation. Each of the two periods, worth six course credits, was to take place in an actual working environment, under the responsibility and supervision of a mentor who was fully qualified and experienced in the field of Measurement and Evaluation. Another stipulation was that each of these training periods should total about 270 working hours.

Having approached Mr. André Paquin, Director, Employment Counselling Division, and Mr. Guy Busque, Head, Analysis and Evaluation, Employment Counselling Division, at Head Office, it was agreed that the Canada Employment and Immigration Commission (CEIC) was going to be the working environment in which the two sessions would take place, under the local responsibility of Mr. Guy Busque.

An understanding was reached with Mr. Busque that the theme, or the topic for both sessions would be the "Certification in Testing Program".

Hence, this document constitutes a report on the exploratory research conducted on that program. On that basis, the content of the report could be of interest to any researcher wishing to examine the aspects dealt with in more depth, and thus to confirm or to invalidate its conclusions.

Despite the limits inherent in any exploratory research, the different aspects dealt with seem to justify my belief that it could be of some use to whoever will be given the task of preparing the other four parts of counselling training, based on skills, and to those who have, or will have to organize, administer or "digest" this type of training.

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At the end of my research, I should like to express my very sincere thanks to:

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Mr. Luc Bégin who was, throughout these six months, an intelligent, warm, efficient and stimulating resource person.

The 124 counsellors PM-2 who sustained my motivation throughout my research, by their enthusiasm, their positive outlook, and their eagerness to know the results of my work.

The 19 managers of the CECs I visited, for their ready co-operation.

Jacques Banon and Josée Breton Martel, for the speed and efficiency of their actions.

The Counselling Consultants, for their frank comments and their valuable opinions.

Last but not least, Mr. Raynald Gagné and Mr. André Paquin, for having shown faith in my ability to carry this project to its conclusion, and for having made it possible for me to experience 6 months of research which proved extremely enriching both from the professional and the personal point of view.

Introduction

The Employment Counselling Division of the CEIC has, for some years been working on a training plan for employment counsellors, based on skills. At the present time, it is anticipated that this training will include, at least, the following five parts:

— client evaluation
— individual counselling
— group counselling
— accountability
— testing.

This training plan, of nation-wide scope, started off with the "testing" part, in the form with which we are now familiar, that is to say, Certification in Testing. Since testing was the first of the five parts to be made operational at local office level, some six years ago, it would be interesting to evaluate some of its aspects, and thus to take advantage of this experience with a view to possibly making provision for, improving or honing the effectiveness of the other four parts, which should follow very shortly.

The certification program has not, so far, been evaluated in depth, because it had to be given time to get off the ground, to grow, to become known and to be put to use. In short, the Certification in Testing Program had to be given the chance to reach its cruising speed.

The following observations would seem to justify the belief that, at least in Quebec, the program has now reached a sufficient level of maturity to start evaluating the way it has performed, and the way in which it has been utilized:

- about 80 per cent of the Quebec CECs have at least one employment counsellor who is certified in testing.
- the number of counsellors interested in being certified in testing has dropped considerably. This has resulted in an increasingly prevalent linking of two or three districts, in order to form a sufficiently large group to participate in the training sessions.
- about 1,500 employment counsellors across Canada are now certified.

It is in the light of this information, therefore, that the two previously mentioned training periods in Measurement and Evaluation were devoted to an evaluation of certain aspects of the Certification in Testing Program. With this in view, three measurement devices were administered to 116 employment counsellors in the Quebec Region. Each of these measurement instruments was designed to answer a very specific question.

My first measurement device was a questionnaire seeking to collect demographic data on the 116 employment counsellors in order to gain a better understanding of the question WHO decides to seek certification, and WHO decides against it. More specifically: could there be a "prototype portrait" . . .

a) of the employment counsellor with certification in testing?
b) of the employment counsellor who is enrolled in the certification process but is not yet certified?
c) of the employment counsellor who did enroll but who dropped out for some reason or other?
d) of the employment counsellor who never embarked upon participation in the process?

My second measurement device was a Grouping Task created by Luc Bégin. By means of this test I was able to explore, grosso modo, the cognitive style of the 116 employment counsellors evaluated in the Quebec Region.

More precisely, the question of "HOW" the 116 employment counsellors evaluated deal with information, or what tools they need in order to learn what we want them to learn. This applies to the four categories of employment counsellors enumerated in the previous paragraph.

Lastly, my third measurement device was a Description Task, created by Luc Bégin, whereby we wanted to find out "WHY" an employment counsellor decides to obtain certification, or why he or she does not, on the basis of his or her inclination to the humanities or to the exact sciences.

To sum up, the plan to evaluate the program is sub-divided into three broad questions:

WHO?
HOW?
WHY?

I should point out, here, that bearing in mind:

- the scope of the subject chosen
- the framework within which this research (Periods I and II) was carried out
- the time at my disposal (6 months) and
- the measurement instruments available and necessary in order to collect the information (language, administration procedure, duration of administration, etc . . .)

I deliberately limited this research to a purely exploratory study.

Though fully aware that such a decision necessarily restricted the general applicability of the conclusions, I feel that on the other hand this research will yield sufficient information to enable subsequent researchers to find out whether it would be worthwhile extending my theories for use on a national scale. I shall, therefore, limit the range of my conclusions to some twenty CECs in the Quebec Region.

Since the major concern of any so-called "exploratory" study is to investigate hunches and ideas for the purpose of formulating theories, the plan for this research had to be sufficiently flexible to be adjusted as and when any new aspect cropped up with regard to certification in testing.

Throughout this report, a major part will be devoted to the analysis and interpretation of data, rather than simply setting forth the facts in the hope that the data will speak for themselves. I felt that it was more appropriate to try to provide the persons who will have the responsibility of decision-making with a series of interpretations, recommendations or alternatives liable to be of some help in the decisions they will have to make in order to further develop the program in question.

Chapter I

Sample — Instruments and Experimental Conditions

1. *Description of Sample*

The sample used for this research was determined on the basis of the number of Canada Employment Centres (CECs) in the Quebec Region, rather than on the basis of an indefinite number of employment counsellors whom we would otherwise have had to reach. Thus, 19 CECs in the Quebec Region were selected to constitute the sample for this research.

We agreed, from the outset, that:

- 1/3 of the sample would consist of CECs with urban area characteristics, i.e.:
  - predominantly secondary and tertiary economic sector
  - high density population
  - relatively large number of inhabitants.
- 1/3 of the sample would consist of CECs with rural area characteristics, i.e.:
  - sparsely populated
  - relatively low number of inhabitants
  - predominantly primary economic sector (agriculture).
- 1/3 of the sample would consist of CECs relatively far removed from their district office.

The selection of these CECs was made on the basis of what Isidor Chein calls a "stratified sample". In such a sampling, it is a matter of making a selection among the cases to be included that will meet the needs of the survey, but on the understanding that any possible errors of judgment in the selection will tend to cancel each other out.

Within these 19 CECs and their branch office or offices, 116 employment counsellors agreed to respond to the three measurement devices. It is important to point out here that by "employment counsellor" I mean any PM-2 involved with employment, regardless of whether he or she works as co-ordinator of training programs, counsellor for special needs clients, or regular employment counsellor.

It should also be pointed out that this sample could not be representative of all of the Quebec Region's employment counsellors, and that being so, we cannot possibly extrapolate the results at regional level.

Table 1 is a list of the CECs which agreed to participate in this research.

Table 1

List of CECs which participated in the research

A) *Six urban CECs*

- St-Denis-Rachel
- Laval
- Trois-Rivières
- Sherbrooke East
- Québec-Beauport
- Sorel

B) *Seven rural CECs*

- Granby
- Cowansville
- Châteauguay
- Valleyfield
- St-Jean
- St-Hyacinthe
- Dorion

C) *Six CECs remote from district offices*

- Rouyn
- Val d'Or
- Gaspé
- Baie Comeau
- Dolbeau
- Chandler

2. *The Devices Used*

2.1 A questionnaire designed to collect general information on the counsellors

- the counsellor's position with regard to the Certification in Testing Program
  a) certified
  b) enrolled but not certified
  c) was enrolled but no longer is. What we refer to as a "drop-out"
  d) never enrolled
- number of years of formal education
- age

- sex
- number of years of experience as PM-2
- experience or no experience in testing prior to certification
- experience or no experience as psychotechnician prior to certification
- scores achieved in theoretical and practical evaluation of certification in testing
- number of attempts at either one of the two evaluations of certification
- number of hours of study before the training session in testing.

The participants answered the questionnaire directly in less than five minutes.

2.2 Grouping Task

The following are some of the questions to which this research wanted to elicit answers:

- What do the employment counsellors need in order to learn?
- Do the teaching aids and the content of the session of the Certification in Testing Program represent the "tools" the counsellors need in order to learn?

Since there are very few measurement devices available that could enable me to seek, within a limited time span and at minimum cost, all the information I needed to answer these questions, my choice was dictated by practical as well as theoretical considerations.

Suffice it to recall that this task evaluates a subject's ability to absorb a growing volume of information.

The task chosen consisted of 30 index cards size 11 cm x 5.5 cm, on which different activities are entered. Each of these 30 activities are expressed by a verb (infinitive) and a direct object (ex: weave a blanket).

All of these activities were taken, in equal numbers, from each of the scales of the Canadian Occupational Interest Inventory. The instructions are relatively straightforward: put together what belongs together, and explain briefly, in respect of each of the groups of activities, why they were put together. Although no time limit was imposed, 30 to 45 minutes are sufficient to complete this task, depending on the respondent's age.

Depending on whether the respondent focuses more on the object and/or the action presented in each of the activities, he or she will achieve a score between 1 and 5 (5 being the highest).

The following is a brief definition of each of the five levels of the scale:

a) Configurative stage (level 1)
- corresponds to Piaget's pre-operational phase.

At this level, individuals
- can apply their knowledge only to aspects that are identical with or the equivalent of what they have already learned
- they operate by imitation, hence without any personal initiative
- they need to have every rule explained to them clearly and in concrete terms
- they are unable to understand or apply any theoretical or abstract principle.

b) Trans-configurative stage (level 2)
- corresponds to Piaget's concrete phase.

At this level, individuals
- can understand and apply a principle, provided they are given concrete learning support
- in order to function, they need very strict rules and norms
- they prove to be incapable of self-management in their activities
- their learning experiences are limited to what is concrete, and they find their bearings only on the basis of what they like.

c) Proto-reflective stage (level 3)
- corresponds to Piaget's formal phase.

At this level, individuals
- are able to learn by theory or in abstract terms, but even so they need to be guided by very strict rules or norms
- they are guided by social norms
- they are capable of self-supervision within a very strict framework.

d) Reflective stage (level 4)
- corresponds to a post-formal phase.

At this level, individuals
- are no longer bound by externalized norms for their actions
- they are what they want to be, and they choose whether or not to adjust to a given situation
- they are able to reflect on their own actions, and can take the context into consideration when necessary

- they can modify or accept a norm or a context, depending on circumstances.

e) Trans-reflective stage (level 5)
- corresponds to a post-formal phase.

At this level, individuals
- can reflect on their own actions
- can justify, theoretically as well as practically, the reasons why they change norms
- can accept or change things while at the same time accepting the consequences.

In the course of his research in connection with Grouping Task, Luc Bégin found that whenever a subject made heterogeneous groups (ex: trans-configurative and reflective), this indicated the presence of anxiety. Moreover, the presence of anxiety was nearly always accompanied by "a permanent lack of occupational goal".

Since anxiety almost totally inhibits the ability to "digest" information, it would be interesting to find out whether the "drop-out" phenomenon and failure in theoretical and practical examinations could be linked to the presence of anxiety.

2.3 Description Task

The results obtained by means of this task enabled me to explore the following questions:

- Why does an employment counsellor decide to enroll in the Certification in Testing process?
  - a) is it because he or she sees in the certification a means of closer touch with the client's affects and of being more empathetic? (disposition to the humanities).
  - b) is it because he or she sees in the Certification in Testing a means of seeking exact concepts, precise and objective ways of helping a client? (interest in the exact sciences).
- Can one claim that a person who is drawn to the humanities will have a higher score in the practical examination, and a lower score in the theoretical part than a person with an inclination to the exact sciences, and vice versa?
- Can one conclude that a person who is certified in testing and whose interests tend in the direction of the exact sciences will be less likely to interpret psychometric tests than a person who is

drawn to the humanities? Because after all, a good interpretation of a psychometric test depends more on being in touch with the client's affect than being in contact with precise and objective norms and concepts.

The description task was created by Luc Bégin, and it measures the subject's ability to associate affects with very objective data. Thus, this task measures the respondent's ability to project empathy.

The task consists of giving the subject an occupational monograph and asking him or her to read it carefully. When they have finished reading, we ask them to "*describe a person in that occupation*".

As a rule, the scores in this task are between 1 and 6. Score "1" represents a lack of empathy, and 6 an extremely high degree of empathy. In order to describe each of these 6 scores briefly, we have identified them as follows:

1 = transcription of monograph
2 = paraphrase
3 = transitory
4 = simple indications
5 = complex implications
6 = meaning, or moral role of the occupation

In order to simplify interpretation of the scores of the respondents as a whole, I groupe scores 1 and 2 of the scale as indicating a leaning to the exact sciences, and scores 3, 4, 5 and 6 as indicating an interest in the humanities.

3. *Experimental conditions*

Once the 19 CECs had been selected, I suggested to each of them a date when I could visit them to meet all the PM-2s working in the Employment section, some of them dealing with special need clients, others involved in training (CMTP and CMITP) and operations, regardless of whether or not they were specified.

My visits to these CECs covered the period from November 27, 1981 to January 7, 1982. At each meeting with the PM-2s, the presentation of the measurement devices was invariably the same:

— Demographic questionnaire
— Grouping task
— Description task.

Once all the respondents' responses had been corrected, I sub-divided them (by computer) into several groups, which was to enable us to spot possible variations when analyzing the scores. These sub-divisions of the respondents are:

G_1 = PM-2s certified
G_2 = PM-2s enrolled but not yet certified
G_3 = PM-2 drop-outs, i.e. enrolled, but did not finish
G_4 = PM-2s never enrolled
HU = PM-2s with leanings to humanistic studies
EX = PM-2s with leanings to the exact sciences
ANX = PM-2s who exhibited symptoms of anxiety
NANX = PM-2s with no noticeable anxiety.

Table 2 shows the breakdown of each of these groups.

Table 2

Breakdown of groups in relation to total sample

	Number	%
G_1	40	34.5
G_2	15	12.9
G_3	15	12.9
G_4	46	39.7
HU	60	51.7
EX	56	48.3
ANX	40	34
NANX	76	66

Chapter II

Analysis of Results

1. *Who Gains Certification? Who Does Not?*

In order to furnish certain answers to these questions we shall first compare the four groups in terms of the following variables:

- education
- age
- sex
- experience as PM-2

We shall, then, consider separately Group 1 (certified PM-2s) in relation to the following variables:

- hours of study
- experience in testing, prior to the Certification in Testing Program
- experience as psychotechnician prior to the Certification in Testing Program
- number of interpretations of psychometric tests
- scores in theoretical evaluation
- scores in practical evaluation (cassette)
- number of attempts at practical evaluation (cassette)

1.1 Formal education:

Although Table 3 indicates that on average, the group of PM-2s who never enrolled in the certification process appears to differ from the other three, we used a statistical technique called test "t" to verify whether this difference between the averages could be significant.

Table 3

Education: Average and variability for the 4 groups of counsellors

	G_1	G_2	G_3	G_4
Average	15.46	15.76	15.2	14.31*
Standard deviation	3.70	3.07	3.17	3.92
Number	40	15	15	46

*G_4 vs G_1 significant to $P = 0.05$ ($T > 1.645$)
G_4 vs G_2 significant to $P = 0.05$ ($T > 1.645$)

This statistical technique proves that Group 4 significantly differs ($P = 0.05$) from Groups 1 and 2 (PM-2s certified or enrolled) in relation to average education, with Group 4 having a lower educational average than Groups 1 and/or 2 (14.3 vs. 15.5 and 15.8). No other significant difference was observed between the other groups.

1.2 Age:

The group of PM-2s enrolled in the certification process is the one whose average age is the lowest. A test "t" conducted with these four averages shows that Group 4 (PM-2s not enrolled) is significantly older than Groups 1 (certified PM-2s) and 2 (PM-2s enrolled), but no older than Group 3 (PM-2 drop-outs).

Table 4

Average age for the 4 groups

	G_1	G_2	G_3	G_4
Average	39.2	34.8	39.8	44.24*
Standard deviation	9.08	7.31	9.44	10.09
Number	40	15	15	46

*G_4 vs G_1 significant to $P = 0.01$ ($T > 2.328$)
G_4 vs G_2 significant to $P = 0.01$ ($T > 2.447$)

On the basis of Table 5 we noted that nearly 61 per cent of the PM-2s in Group 4 are aged 40 years and over, while in the 3 other groups the position is reversed.

Table 5

Frequency distribution of age brackets,
for the 4 groups (percentages)

	G_1	G_2	G_3	G_4
25 - 29 years	5	13.3	0	6.5
30 - 34 years	35	46.7	40	8.7
35 - 39 years	25	20	26.7	23.9
40 - 44 years	10	13.3	0	13
45 - 49 years	2.5	0	20	15.2
50 - 54 years	12.5	0	0	15.2
55 - 59 years	10	6.7	13.3	8.7
60 - 64 years	0	0	0	8.7
	100%	100%	100%	100%

	G_1	G_2	G_3	G_4
39 years and under	65	80	66.7	39.2
40 years and over	35	20	33.3	60.8

1.3 Sex:

It will be seen, in Table 6, that women tend to be underrepresented in all four groups, but a little more so in Group 3 (PM-2 drop-outs). However, none of these tendencies is significant.

Table 6

Distribution of men and women
for each of the groups (percentages)

	M	W
G_1	68	32
G_2	73	27
G_3	80	20
G_4	67	33

1.4 Experience as PM-2:

As shown in Table 7, the average years of experience of Group 2 (PM-2s enrolled) differs significantly ($P = .01$) from all the other averages. This significant difference is closely related to the average age of the same group, which was: 34.8, compared to 39.2, 39.8 and 44.24. It is altogether normal to expect that the number of years of experience goes in tandem with age.

Table 7

Average number of years of experience, by group

	G_1	G_2	G_3	G_4
Average	8.85	5.06*	9.33	9.70
Standard deviation	4.19	5.50	3.50	4.57
Number	40	15	15	46

*G_2 vs G_1 significant to $P = 0.01$ ($T > 2.447$)
G_2 vs G_3 significant to $P = 0.01$ ($T > 2.457$)
G_2 vs G_4 significant to $P = 0.01$ ($T > 2.447$)

Table 8 gives an overall behavioural pattern of the 4 variables under review, in relation to the 4 groups.

Table 8

Comparison of the variables: education, age, sex, and years of experience for the 4 groups

	Education	Age	Sex		Years of experience
			M	W	
G_1 (40)	15.46	39.2	68	32	8.85
G_2 (15)	15.76	34.8	73	27	5.06**
G_3 (15)	15.2	39.8	80	20	9.33
G_4 (46)	14.31**	44.24**	67	33	9.70

* Significant to $P = 0.05$
**Significant to $P = 0.01$

For the description of the following seven variables, we shall confine ourselves to Group 1 (Certified PM-2s).

Their responses to the questions pertaining to experience in testing and as psychotechnician were distributed, as follows:

1.5 Experience in testing:

"Prior to being certified in testing, had you ever interpreted one or more aptitude and/or interest tests?"

YES = 73%
NO = 27%

1.6 Experience as psychotechnician:

"Prior to being certified in testing, had you ever worked as a psychotechnician?"

YES = 15%
NO = 85%

1.7 Hours of study:

Looking at the frequency distribution showing the number of hours of study put in at home or at work in order to prepare for the training session, (Table 9), it will be noted that nearly two thirds (60%) of the certified PM-2s spent more than 30 hours to prepare themselves for the training session. It would have been interesting to ascertain what proportion of these preparatory studies was performed other than at work. Given this rate of 60% of the PM-2s who put in more than 20 hours to study for the training session, one may well ask whether the 30 hours of study allocated by the Commission within working hours constitute a realistic number of hours of preparation, bearing in mind what a PM-2 has to know, and to know how to do, in order to become certified.

Moreover, we shall see later on that the number of hours of study is closely related to the score in the practical examination and to the use of psychometric tests.

Table 9

Frequency distribution of number of hours spent on preparation (study) (percentages)

Hours		
None	=	0 %
1–15	=	7 %
16–30	=	32.5 %
31–45	=	35 %
46–60	=	15 %
60 hours or more	=	10 %

1.8 Number of interpretations/year:

The study appears to prove that 10 per cent of the certified counsellors did not interpret any psychometric tests during the past year, that 10 per cent of them interpreted an average of 1 per month, and that 20 per cent interpreted an average of 1 per 6 months.

In that connection: when I visited the CECs, several PM-2s, without being questioned, justified the fact that there had been few interpretations of psychometric tests, on the following grounds:

- — not sufficient time is allocated on the EOSR to make a satisfactory interpretation of these psychometric tests.

- some managers, who do not believe in the effectiveness of such instruments, not only refrain from encouraging their use, but they actually restrain it.
- bearing in mind the many priorities with which the counsellors have to cope, they do not have enough working hours left for any effective testing.

Table 10

Frequency distribution of number of GATB or COII interpreted per year

None	10 %
1 to 3 per year	20 %
4 to 6 per year	27.5%
7 to 9 per year	10 %
10 to 12 per year	10 %
13 to 15 per year	2.5%
15 or more per year	15 %

Using Pearson's correlation coefficient (Table 11) it will be noted that a significant and positive relation exists, between the number of psychometric tests interpreted per year and the number of hours of study put in. This relation indicates that as the number of hours of study increases, the number of test interpretations rises accordingly. And the reverse also holds true: when one of these two variables is reduced, the other also declines.

One may try to explain this relation by saying that the same degree of interest and motivation an employment counsellor brings to the preparation for the training session is also present in the use of GATB and/or COII tests.

1.9 Scores in theoretical and practical evaluation:

The averages of these two evaluations are more or less the same, and so is their distribution. (See Table 12). On the other hand, the correlation matrix of Table 11 shows that virtually no relation exists between these two evaluations (r = .0393). It does not follow that a counsellor who scores highly or gets low marks in one of the two evaluations, will get an equally high or low score in the other evaluation.

The same table also indicates a very significant relation (P = 0.01) between the practical evaluation and the number of

Table 11

Correlation between 6 variables for Group 1

	education	hours of study	number of interpretations	practical evaluation	theoretical evaluation	attempts at practical evaluation
education	—	.0598	.0174	.1092	.2562	.0478
hours of study		—	.4004*	.4101**	.0089	.0855
number of interpretations			—	.4131**	-.0486	.0013
practical evaluation				—	.0393	-.0476
theoretical evaluation					—	.0782
attempts at practical evaluation						—

* Significant to P = 0.05 (r = .312)
**Significant to P = 0.01 (r = 403)

hours of studies put in. Since this relation is positive, one may conclude that the more a PM-2 studies in order to prepare for the training session, the more the scores in practical evaluation go up, and vice versa.

Table 12

Frequency distribution of scores achieved by the certified PM-2s in theoretical and practical evaluation (percentages)

	Evaluation	
%	Theoretical	Practical
60 to 64	15	0
65 to 69	7.5	17.5
70 to 74	32.5	12.5
75 to 79	12.5	27.5
80 to 84	25	20
85 to 89	7.5	15
90 to 94	0	7.5
95 to 100	0	0
	100%	100%
Average	74.11	79.05
Standard Deviation	7.54	7.365

Yet, the relation is nil (.0089) between the number of hours of study and the scores in theoretical evaluation. Since studying means the acquisition of knowledge it is, to say the least, surprising to find that no relation exists between this preparation and the theoretical evaluation, which is also a matter of knowledge.

Lastly, a significant and positive ($P = 0.01$) relation will also be noted between the practical evaluation and the number of interpretations ($r = .4131$). This relation means that a high score in practical evaluation corresponds to a high number of interpretations, and vice versa. Does having achieved a high score in practical evaluation reassure the PM-2 to the point where he or she no longer feels threatened by a test interpretation? It has been seen that a significant and positive relation exists between the number of hours of study and the marks in the practical examination on the one hand, and between the practical examination and the number of interpretations on the other. Does this mean that the same degree of interest and motivation in the preparation, which enabled the PM-2 to score proportionally in practical evaluation, also shows up in the actualization of his training, i.e. interpretation?

1.10 Number of attempts at practical evaluation:

When looking at Table 13 it will be noted that one third (33%) of the PM-2s pass in practical evaluation at the first attempt. Of the PM-2s who participated in this study, 63% failed at the first attempt, and 5% failed the second time round. It follows that the majority of the PM-2s had to try twice (2 cassette recordings submitted) before they passed the practical evaluation (examination).

No significant relation, or trend, was observed between this variable and the ones reviewed previously.

Table 13

Frequency distribution of the number of attempts at practical evaluation (percentages)

1 attempt	= 32.5
2 attempts	= 62.5
3 attempts	= 5
	100 %

2. *How Do the PM-2s Learn?*

Luc Bégin's Grouping Task will certainly shed some light on this subject. Once we have explored this question it will be a little easier to find out whether the teaching aids, the training content and the teaching techniques are geared to the needs of the PM-2s who enrolled in the Certification in Testing process.

It will be recalled that this test gives scores from 1 to 5 (5 being the highest) and that each of these levels represents a very specific manner of assimilating information (pp. 10 to 12).

First, let us see how the whole of the sample (116 PM-2s) is distributed in respect of each of these 5 levels: Table 14 shows that on the whole, the PM-2s who participated in the study scored 3.11, and that more PM-2s are to be found above than below level 3.

Breaking down the analysis of these results in a little more detail (Table 15) one discovers that all of the PM-2s at level 2 belong exclusively to Group 4, and that 100 per cent of the PM-2s who reached level 5 belong to Group 1.

Table 14

Percentage breakdown of sample at each level of the Grouping Task

1 = 0
2 = 6.6
3 = 77.6
4 = 15.5
5 = .9
100%

Average = 3.11
Standard deviation = .55

Table 15

Percentage distribution, average and variability of the groups at each level of the Grouping Task

	1	2	3	4	5	Average	Standard deviation
G_1 (PM-2 certified)	—	—	85	12.5	2.5	3.18	.4409
G_2 (PM-2 enrolled)	—	—	93	7	—	3.07	.249
G_3 (PM-2 drop-outs)	—	—	93	7	—	3.07	.249
G_4 (PM-2 never enrolled)	—	15	61	24	—	3.09	.596

Groups 2 and 3 are almost entirely concentrated at level 3, while the same proportion of Group 1 (15%), which is above level 3, is to be found in equal proportion (15%) below level 3 in Group 4.

Tests "t" carried out confirm that the differences between the groups are not sufficiently pronounced to make any significant difference.

It is not surprising to find that there are no certified PM-2s to be found at level 2, bearing in mind the inherent characteristics of this stage, and the requirements for certification.

These characteristics are frequently in contradiction with what is required for the Certification in Testing process. In Table 16, we have juxta-

Table 16

Parallel between the characteristics of levels 2, 3 and 4 and the certification requirements

Level 2	Level 3	Level 4	Preparation for the session	Levels required
Need of concrete learning support	capable of learning by theory or abstract concepts	is able to reflect on own actions	Not very structured: - nobody obliges anybody to study - nothing to indicate what and when to study - few directives tell what and how to study	4 & +
Self-managed activities not possible	capable of self-supervision within a very strict framework	needs self-supervision	- Self-management in determining hours of study - Theoretical and not very concrete learning material	4 & + 3 & +
Need of very strict rules and norms	need to be guided by strict norms or rules	can accept or change a norm if necessary	- Content: highly abstract few examples	3 & +

Table 16 (continued)

Parellel between the characteristics of levels 2, 3 and 4 and the certification requirements

Level 2	Level 3	Level 4	Preparation for the session	Levels required
			During the session	
Concrete stage	formal stage	post-formal stage	- 50% authoritative, structured, ''cook book'' style	3 & +
			- 50% structured, ''experiencing'' style	3 & +
			theoretical learning material	3 & +
This person is guided by social norms	this person is guided by social norms	the person is no longer bound by external norms	- content theoretical, abstract	3 & +
			After the session	
No autonomy	very little autonomy	needs autonomy	- not very structured	4 & +
			- great deal of autonomy	4 & +
		the person is what he/she wants to be, and chooses whether or not to adjust	- very strong self-supervision	4 & +
			- adjustment of norms and principles to client's actual experience	4 & +

posed the characteristics of levels 2, 3 and 4 cognitive styles with the present level of requirements of the Certification in Testing process.

What stands out rather clearly is that, on the whole, a level 4 of cognitive style (reflective stage) is strongly recommended, even necessary, for an individual to feel at ease throughout the certification process.

It is also interesting to note the difference in level required before and during the session, as well as during and after the session. The pre- and post-session appears to require a very high degree of autonomy and self-supervision, which only levels 4 or 5 can easily muster. It would be interesting to verify at what stage of the process the "drop-out" phenomenon usually shows up, and to look at it in terms of the PM-2s' need, or lack of need, for autonomy, norms, structures, self-supervision et cetera.

Only the portion "during the session" seems to be sufficiently structured to meet the needs of, *at the very most*, 85 per cent of the certified PM-2s.

The term "at the very most" is used because, as explained in the description of the Grouping Task, we should have reduced these 85 per cent by the number of PM-2s who showed symptoms of anxiety: because, when an individual suffers from anxiety, he or she is not only incapable of absorbing new information (i.e. solving a problem) but also unable to make "good" use of what he or she already knows (i.e. identifying the problem).

Table 17 shows that when the anxiety factor is taken into consideration, the periods before and after the session (see Table 16) meet the needs of only 12.5 per cent of the certified PM-2s.

The very high proportion (47.8%) of the PM-2s in Group 4 who suffer from anxiety might explain why people in this group refrained from enrolling in a process which they knew could not meet their needs.

Moreover, as far as PM-2s at level 3 are concerned, this same group (G4) numbers nearly half that of the other three groups.

A "Chi-square" test conducted on frequencies observed in the distribution of cognitive style levels with regard to the 4 groups showed a significant difference: P = 0.01.

This significant difference confirms that the distribution of the PM-2s in terms of the 5 cognitive levels and of anxiety, as far as Group 4 is concerned, cannot be attributed to chance, and differs significantly from the other groups. (Table 17).

Table 17

Percentage distribution of the 5 levels of the Grouping Task for each of the groups, taking into consideration the anxiety factor

	1	2	3	4	5	Anxiety
G_1 PM-2s certified	—	—	67.5%	10%	2.5%	20%
G_2 PM-2s enrolled	—	—	60%	6.7%	—	33.3%
G_3 PM-2 drop-outs	—	—	73.3%	6.7%	—	20%
G_4 PM-2s never enrolled*	—	10.9%	32.6%	8.7%	—	47.8%

* Significant $P = 0.01$

3. *Why or Why Not to Become Certified?*

One should not think that a PM-2 who works in the Employment Section of a CEC is necessarily a person who likes working with people, who is always eager to understand what the other person is going through, and who is continually concerned with people's emotions. On the contrary: bearing in mind the multitude of an employment counsellor's duties, the PM-2s must necessarily include some who are more interested in "things" as opposed to "people", and who are concerned with objective, exact and rational aspects.

On the other hand, and again bearing in mind the many duties of a PM-2, it seems utopian to expect one single individual to combine "human" as much as "objective, exact . . ." polarity. And yet, that is what the duties (of a PM-2) call for. But depending on their own interpretation of their duties as a whole, and depending on their personal interests, they are bound to give priority to some of their duties, to the detriment of others. And the same applies to testing.

As shown in the example below, a PM-2 might very well decide to obtain certification because it is an opportunity to enhance human relations, empathy, and rapport with the client's affect. Others may just as well seek certification in the hope of finding an exact, objective and normative measurement instrument that should allow them to perform a function for which they feel the need.

- Counselling - Group leadership - Social worker • - Testing (interpretation)	humanistic studies
- Clerical work - Educational and occupational information • - Testing (statistics, norms) - Program administration	exact sciences

One might then ask certain questions, such as:

a) Is there a predominant tendency (humanistic or exact) among the 116 PM-2s who agreed to participate in this study?

b) Is there a predominant tendency in each of the groups surveyed?

c) Are there any connections between these two tendencies and the other variables studied previously?

By means of the Description of a person in an occupation (DPO) technique we obtained a score for each of the participants which could vary from 1 to 6. In agreement with the author (Luc Bégin), it was decided that scores 3, 4, 5 and 6 indicated a tendency to humanistic studies, which I shall call THU, while scores 1 and 2 indicated a tendency to the exact sciences, abbreviated to TEX, so as not to encumber the text and the tables needlessly.

3.1 In answer to the question "Is there a predominant tendency among the 116 PM-2s who were evaluated?", Table 18 indicates clearly that there was an almost equal number of PM-2s with a leaning to the humanities (52%) and PM-2s with a bent for the exact sciences (48%).

Table 18

Overall distribution of the sample in terms of THU and TEX.

THU = 52%
TEX = 48%

3.2 Is there a predominant tendency in one of the groups surveyed?

Since there is no significant difference between the groups or within groups, we can only speak of tendencies. It appears that in Groups

1 and 2 there is a very marked tendency to the humanities, whereas exactly the reverse (leaning to the exact sciences) is the case in Groups 3 and 4.

Grouping together the certified PM-2s with those who enrolled (G_1G_2), and doing the same with the drop-outs and those who never enrolled (G_3G_4) we found, by use of a Chi-square test, that there was a significant difference ($P = 0.05$) between these two groups (Table 20). This amounts to saying that the PM-2s in Groups 1 and 2 show a significant inclination to the humanities, while the PM-2s in Groups 3 and 4 show a leaning to the exact sciences.

Table 19

Percentage distribution of the four groups of counsellors in terms of their disposition to humanistic studies or the exact sciences

	THU	TEX
G_1	55%	45%
G_2	66%	34%
G_3	47%	53%
G_4	45%	55%

Table 20

Percentage distribution of two groups of counsellors in terms of their leaning to the humanities or the exact sciences

	THU	TEX
G_1G_2	58%	42%
G_3G_4	46%	54%

3.3 Are there any connections between these two tendencies (THU and TEX) and the other variables studied previously?

An important relation was observed between THU and TEX on the one hand, and sex on the other. Indeed, a significant and negative biserial correlation ($P = 0.05$) indicates that those who are drawn to the humanities do not belong to the same sex as those who show an inclination to the exact sciences, and this applied to groups G_1

and G_2 together (G_1G_2) as well as to groups G_2, G_3 and G_4 together ($G_2G_3G_4$).

Taking a look at Tables 21 and 22 it will be seen that women show a pronounced tendency to the humanities, while men tend to show a marked tendency to the exact sciences.

Table 21

Percentage distribution of THU and TEX according to sex, for group G_1G_2

	THU	TEX
Men	53%	47%
Women	70%	30%

Table 22

Percentage distribution of THU and TEX according to sex, for group $G_2G_3G_4$

	THU	TEX
Men	44%	56%
Women	63%	37%

Conclusion

This exploratory research focuses on the human, rather than the econometric aspects of the Certification in Testing Program. Furthermore, since Certification in Testing will soon be followed by about 4 other training programs of the same type, it may perhaps be possible, on the basis of this study, to confirm, improve or further develop these future 4 parts of training.

In this study, we have endeavoured to answer the following three questions:

- — *WHO* gains certification, *WHO* does not?
- — *HOW* do the PM-2s learn?
- — *WHY* do they, or do they not decide to become certified?

and in so doing, pinpoint different options for possible future research.

With this in view, we visited 19 CECs in Quebec, and evaluated 116 regular PM-2s working in the Employment Section of these CECs. We administered 3 measurement devices to the PM-2s, regardless of whether they were or were not certified, working in the operational unit or the manpower services. Each of these instruments was to enable us to answer the questions: WHO? HOW? and WHY?

The first measuring device, a demographic data questionnaire, showed us that on average, the certified PM-2s and those enrolled in the process are on the whole less educated and younger than the PM-2s who never enrolled in the certification process. Moreover, an average of the PM-2s enrolled in the certification process have fewer years of experience than those who are certified, or dropped out, or never enrolled.

It was noted that among the certified PM-2s, very few (15 per cent) had had any experience as psychotechnician, that nearly three quarters of them (73 per cent) had already interpreted a psychometric test (GATB and/or COII) before being certified, and that two thirds (60 per cent) had put in more than 30 hours of study prior to the training session.

The number of GATB and/or COII interpretations per year is relatively low.

It was noted that as the number of hours of study increased, so did the number of interpretations. A just as significant relation proves that the number of hours devoted to study corresponds to a high score in practical evaluation, but that the same relation does not exist between theoretical evaluation and the number of hours of study.

As for the second measurement device, the Grouping Task, it became quite clear that although the training session as such does meet the needs related to the cognitive scheme of the certified PM-2s, the "before" and "after" training session meets the needs of only 12.5 per cent, and that this situation could partly explain the drop-out syndrome.

Lastly, this device revealed very pronounced differences between the group of PM-2s who never enrolled, and the PM-2s who were certified, enrolled, or had dropped out. On the whole, these differences indicate a lower cognitive style level than that of the other 3 groups, and in addition, a much higher number of PM-2s suffering from anxiety (48 per cent) than the other 3 groups.

Lastly, the third measurement device, the DPO, showed that of the 116 PM-2s evaluated, as a whole, there are as many with interests in the humanities as with interests in the exact sciences.

On the other hand, taking a closer look it will be seen that the distribution of PM-2s certified and enrolled differs significantly from that of the PM-2s who dropped out or never enrolled, with the former tending to the humanities, empathy and affect, while the latter tend to exactness, objectivity and rationality.

Finally, by means of this instrument we were able to note that males, whether certified, enrolled in the process, dropped out or never enrolled, had a leaning to the exact sciences, while the female participants in the same groups tended towards humanistic studies.

Recommendations

Bearing in mind the exploratory nature of this research, these results can be interpreted only as applying to the 116 participating PM-2s. It would not be acceptable to make recommendations with a view to improving the Certification in Testing Program based solely on a limited sample that may not be representative generally. Strictly on that understanding, the following are some recommendations for subsequent research:

1. that the following assumptions be checked by means of a sample based on all the PM-2s in the Quebec Region:
    a) More than 30 hours of study are required for a "good" preparation for a training in testing session.
    b) The drop-out phenomenon is due partly to the fact that there is a lack of structure, and of tools that meet the needs of the PM-2s during pre- and post-training periods.
    c) The PM-2s in the Quebec Region, as a whole, have a cognitive style of 3 (proto-reflective stage).
    d) The PM-2s who participate in a training in testing session lack concrete learning aids, and examples that they could emulate.
    e) A strong proportion of PM-2s in the Quebec Region appears to suffer from anxiety.
2. that efforts be made to check whether there is a critical time at which dropping out occurs in the certification in testing process. In order to do this, one might ascertain the time and the reasons why, individually, PM-2s who were enrolled in the process dropped out.
3. that a follow-up be conducted among the 15 PM-2s enrolled who participated in this research. If our conclusions are valid, at least 5 of these 15 PM-2s will drop out, bearing in mind that 33 per cent of them suffer from anxiety.
4. that a survey be made of the percentage of time spent on the EOSR for interpretation of GATB and/or COII tests, in relation to the proportion of the CEC's PM-2s who are certified.

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